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PNEUMOCOCCAL PAROTITIS

BY

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The common types of pyogenic parotitis are caused by the *Staphylococcus aureus*, the *Streptococcus viridans*, and the pneumococcus. Each of these bacteria gives rise to a pathological and clinical type of the disease with certain clearly defined features. The *Staph. aureus* characteristically gives rise to acute parotitis, the *Strep. viridans* to recurrent parotitis, and the pneumococcus to a recurrent type of the disease in which the exacerbations are severe and may pass on to suppuration and abscess formation. Many other bacteria may occasionally lead to parotitis, but they are seldom met with. Of the three common bacteriological types of parotitis the pneumococcal is the least frequent and the least well recognized, the staphylococcal type being the most common.

The present paper is based on a series of seventeen cases of pneumococcal parotitis which have been under my care and which form the basis of the discussion of the aetiological, pathological, clinical, and prognostic features of the disease. In previous communications (Payne, 1933, 1938) I have described the characteristic features of the disease caused by the *Staph. aureus* and by the *Strep. viridans* respectively. The pneumococcal group presents certain well-defined features in its natural history that have important bearings upon the question of treatment. The recognition of the bacteriological type in any given case of parotitis is not merely of academic importance, but is fundamental in relation to the questions of therapy and prognosis.

Clinical Material

The majority of the seventeen cases now recorded occurred in my own practice; the remainder were under my care at St. Bartholomew's Hospital. Four of the cases were acute, twelve were recurrent, and one case was chronic in type. This classification into acute, recurrent, and chronic cases should not be accepted too rigidly, and some overlapping of the groups certainly occurs. In general, pneumococcal parotitis tends to be of the recurrent type, but the acute case may pass into the recurrent group or the chronic cases show a tendency towards some of the phenomena of the recurrent type. In Table I the main features of the seventeen cases are set out in detail.

Aetiology

There is no single aetiological factor which is constantly present in pneumococcal parotitis; but I do not believe that this type is any exception to the general rule that pyogenic parotitis always has in the background some impairment of the mechanism of mastication. This impairment may be due to dental disease, dental loss, imperfect occlusion, or ill-fitting dentures; it may be due to a deliberate or voluntary restriction of diet in association with acute or chronic illness; or in some cases it may simply be that certain individuals are "poor chewers," often from psychological causes. The importance of mastication is paramount, since this is the most potent stimulus to salivation, and particularly to parotid secretion. If the chewing mechanism is impaired from any cause whatever, then the saliva is seriously diminished in amount and the flora of the buccal cavity is greatly enhanced and even altered. If every case of pyogenic parotitis, whether acute, recurrent, or chronic, is considered along these lines it will be found that a disturbance of the chewing mechanism has preceded the onset of the parotitis, either as a long-standing phenomenon or as a recently developed one. Once infection of the duct system of the parotid has occurred the anatomical configuration of the gland favours its persistence. To these general observations pneumococcal parotitis is no exception. But whereas the type due to the *Staph. aureus* tends either to recover spontaneously or following operation, or to end fatally, that due to the *Strep. viridans* tends to persist in the recurrent form, while the pneumococcal type is characteristically a recurrent type with severe exacerbations which may pass on to suppuration.

The following are some of the more important and detailed aetiological factors in the seventeen cases now recorded.

Sex.—The present series comprised seven males and ten females. There were four acute cases (two males, two females) and one chronic case (male). Of the twelve recurrent cases four were in males and eight were in females. This greater incidence of recurrent cases in females is strictly comparable to the much greater incidence in this sex of the cases due to the *Strep. viridans* (Payne, 1933).

Age Incidence.—The figures given in Table I show that no age is entirely exempt from pneumococcal parotitis. Of the

TABLE I.—*Principal Features of the Series of Seventeen Cases of Pneumococcal Parotitis*

ACUTE

Case No.	Sex	Age	Side	Cause	Bacteriology	Treatment	Result	Comments
1	F	65	R & L	—	Pneumococci	Conservative	Cure	Condition developed in hospital while awaiting eye operation
2	M	16	L	Fatigue after cycling 150 miles on previous day	"	"	"	—
3	F	60	R	? Antecedent obscure pulmonary infection	Pneumococci Type II	"	"	As a young woman nearly died from an acute left-sided parotitis. A left auriculo-temporal syndrome with sweating and hyperaemia on eating had persisted since this illness
4	M	12	L	—	Pneumococci	"	"	—

RECURRENT

Case No.	Sex	Age	Side	Cause	Duration	Attacks	Saliva	Bacteriology	Sialography	Treatment	Result and Comments
5	F	5	R	? Enlarged tonsils. Tonsillectomy 6 months previously. Parotitis started just before operation	7 months	Many, lasting up to a week	Scanty; contained muco-pus	Pneumococci	—	Conservative	Improved
6	M	44	R	? Chill following driving	11 months	Many, lasting up to 3–4 days	Copious; contained large masses of gelatinous muco-pus	Pneumococci, also *Staph. albus* and *Micro. flavus*	Marked dilatation of main duct, with constriction proximal to orifice	Dilatation. Duct operation refused	Improved, and saliva became much clearer. Narrowed duct orifice easily felt with dilators
7	M	5	L	—	2 years	At first every 3 months, now every month. Last about 6 days and are very painful	Muco-pus	Pneumococci	—	Conservative	No further attacks
8	F	51	R & L	Teeth all removed 15 years ago; has never worn dentures	13 years R; 4 years L	Constant severe attacks R and L. Abscess drained L 6 years ago. Much ill-health	Thick greenish-yellow muco-pus	Pneumococci, Type IV, later proved Type VII	Gross dilatation of ducts, with globular dilatation in glands	Duct operations R and L, and external drainage R parotid. *X* rays	L cured; R improved
9	F	13	L	During teething. Constant trouble with teeth	12 years	5 severe attacks, many minor ones. Serious impairment of physical and mental health	Profuse, thick, tenacious, greenish muco-pus	Pneumococci, Type IV	Dilatation of main duct, with globular dilatations in gland	Duct operation. *X* rays	Cure. Complete functional obliteration of gland. Rapid improvement in health
10	M	4½	R & L	During teething	3½ years	4 attacks	Muco-pus	Pneumococci	Slight dilatation of finer ducts	—	Discharged at parent's request
11	M	34	R	Eczema as a child. Mother has asthma very badly	5 years	Very severe attack of bilateral parotitis 5 years ago. Since then attacks every few days	Profuse muco-pus from both sides	"	—	—	Did not attend subsequently. Right duct orifice was patulous
12	F	33	R & L	—	1 year	Left parotid up and down every few days	Muco-pus	"	Both sides normal	*X* rays	Improved
13	F	9	R	—	13 months	4 in all. Take a few hours to develop; lasting two days	"	"	—	—	Did not attend further
14	F	40	L	—	5 years	Every 2–3 months; lasting 3–4 days	"	"	Marked segmental dilatation affecting chiefly main duct	Duct operation	Much improvement, but attacks started 5 months later
15	F	44	R & L	4 years ago all teeth out for pyorrhoea	18 months	1 attack R, 3 attacks L. Seen during severe acute attack on L, with marked constitutional disturbance	Thick yellowish muco-pus	"	—	Conservative at onset, then drainage of two large abscess cavities in left parotid	Cured
16	F	2 11/12	R & L	During teething	22 months	Many	Blobs of muco-pus	Pneumococci, Type II	—	Conservative	Under treatment

CHRONIC

17	M	45	R	—	19 years	Constant local pain and swelling. A few mild recurrent attacks. External salivary fistula for past 2 years	Muco-pus	Pneumococci	—	Exploration and drainage of gland, no calculi present. *X* rays	Cured

four acute cases two occurred in later middle life (ages 65 and 60) and two in adolescence (ages 16 and 12). Of the twelve recurrent cases three started between the ages of 1 and 2, three between the ages of 3 and 8, and the remaining six at ages varying from 29 to 43. It is apparent, therefore, that in the recurrent group one-half of the cases developed during the period of either the first or the second dentition, and the remainder during the first half of adult life. Case 17, the only one to which the term chronic can be applied, started at the age of 26.

Duration.—In the recurrent group of cases the duration of symptoms before coming under my observation varied from seven months to thirteen years. The one chronic case had given rise to symptoms extending over nineteen years. These figures indicate the great tendency to persistence which characterizes the pneumococcal type of parotitis.

Side Involved.—The twelve recurrent cases involved the right side in four, the left side in three, and both sides in five. In these five bilateral cases the disease had involved both sides at onset in four, and in the remaining case the parotitis developed on the second side nine years after the first.

Dental Factors.—It has already been pointed out that in the recurrent group one-half of the cases started during the period of either the first or the second dentition, and in some of the cases beginning in infancy the mothers volunteered the information that the condition started with the onset of teething. In Case 9, that of a girl of 13, the parotitis had been present since the age of 1 year and 10 months, and the patient had always had great trouble with her teeth, was constantly under her dental surgeon, and was still wearing apparatus when she came under observation. Full dental details are not available for all the earlier cases occurring in adults. In Case 8, however, that of a woman of 51 who had had all her teeth removed fifteen years previously and who had never worn her dentures, the parotitis had been present for thirteen years on the right side and for four years on the left.

Allergic Factors.—It has been suggested that an allergic factor is responsible for some of the cases of parotid enlargement seen in infancy and childhood. Several of the published cases certainly suggest that this may be the fact, but personally I have yet to see a case of recurrent parotid enlargement in infancy in the absence of both pus and bacteria as determined by the results of catheterization of the duct. Patient No. 11, a man aged 34, suffered from eczema as a child but had never had hay-fever or asthma, although his mother suffered from these two diseases. The parotid secretion from this patient was profuse muco-pus, which yielded a pure growth of pneumococci from the two sides.

Enlarged Tonsils.—There is nothing in the series as a whole to suggest that tonsillar infection as such played an important part. In Case 5, that of a girl of 5, tonsillar enlargement was thought to be the predisposing factor, and tonsillectomy was carried out one month after the onset of the parotitis and six months before the patient came under my care.

Fatigue and Chill.—It is possible that fatigue and chill may occasionally be factors leading to the onset of parotitis by causing diminution in saliva, alteration in buccal flora, and diminished tissue resistance. In Case 2, a youth aged 16 developed acute pneumococcal parotitis the day after getting very fatigued from cycling 150 miles in a day. Patient No. 6, a man aged 44, attributed the onset of his recurrent right-sided parotitis to an occasion when he got extremely cold while driving his car.

Other Pneumococcal Infections.—There is nothing in the available evidence to suggest that pneumococcal parotitis is specially prone to arise in patients with proved pneumococcal infections. When acute parotitis develops during the course of pneumococcal infection of the lungs it is almost invariably caused by the *Staph. aureus* and not by the pneumococcus. In none of the seventeen cases now recorded was there any evidence pointing to an associated pneumococcal infection; but in Case 3 an unexplained and prolonged pulmonary infection that might possibly have been pneumococcal in nature immediately preceded the development of the parotitis.

Summarizing the available evidence in connexion with pneumococcal parotitis, it is certain that dental factors are important in leading to disturbances of mastication and parotid function, that the recurrent disease tends to develop during the periods of the first and second dentition or during the first half of adult life, that an allergic factor is not proven, and that there is little evidence to relate the development of the disease to other existing pneumococcal infections.

Pathology

No gross or histological material was available for study, as none of the recorded cases came to necropsy, and in none of the cases in which operation was performed would it have been justifiable to remove adequate parotid tissue for histological examination. Certain observations on the pathology of pneumococcal parotitis may be based on a knowledge of other bacteriological types of parotitis and upon the clinical and operative findings in the pneumococcal group.

Pneumococcal parotitis is an ascending infection from the buccal cavity strictly comparable to the other types of pyogenic parotitis, and its main pathological features do not seriously differ from them. The nature of these pathological changes must depend on the acuteness of the process, the degree of duct obstruction, and the extent of the invasion of the gland parenchyma. The evidence does not suggest that the acute type of the disease ever gives rise to miliary abscesses scattered throughout the gland such as I have described in cases due to the *Staph. aureus*. These pneumococcal cases usually resolve fairly rapidly and leave no trace behind. If rapid resolution does not occur, then the process is likely to pass into a recurrent or a chronic phase. In the recurrent cases there are certain features of pathological interest. First, the secretion in the duct system is thick and tenacious and contains a large amount of mucus; secondly, as a corollary of this the ducts as shown by sialography (described in detail later) are of a gross and irregular type; thirdly, there is a tendency to the formation of deep abscesses in the gland tissue during the acute exacerbations; and, finally, the clinical evidence suggests that there is a greater degree of gland destruction and fibrosis than is found in the cases caused by the *Strep. viridans*.

Bacteriology

Material for bacteriological examination was obtained from all cases by catheterization of the parotid duct, and was also recovered from the parotid abscesses in the cases submitted to external drainage. In every case pneumococci were present, and they were often intracellular, either in leucocytes or in the large polyhedral or tall columnar cells found in the secretion in the recurrent cases. Cultures were carried out in fifteen of the cases, and these confirmed the presence of pneumococci. In fourteen of them the culture was a pure one, but in Case 6 it was associated with *Staph. albus* and *Micrococcus flavus*. Typing of the strain of pneumococcus was carried out in four cases, with the following results: Case 3, Type II; Case 8, Type IV, proved later to be Type VII; Case 9, Type IV; Case 16, Type II. It is apparent that no single strain of pneumococcus is responsible for all cases of pneumococcal parotitis.

Clinical Types and Features

Pneumococcal parotitis may be of an acute, recurrent, or chronic type. The limitations of this classification have already been indicated, but it is retained for the purposes of analysis and description.

Acute.—This type develops fairly rapidly during the course of one or two days in a patient who has not previously had parotid trouble (Case 3 is possibly an exception to this). The degree of parotid swelling is moderate, marked tenderness of the whole gland is present, there may be complete duct obstruction, and in the worst cases fever and constitutional disturbance are present. The most acute case in the series was No. 3, and in this instance the question of external drainage was in the balance for several days, but eventually the acute phase cleared up with conservative measures. The degree of associated duct obstruction is naturally an important determining factor in all cases. I have never, however, seen a really fulminating case of pneumococcal parotitis comparable to some of the worst cases caused by the *Staph. aureus* and occasionally by the *Strep. haemolyticus.*

Recurrent.—The main features of this type of the disease are similar to those found in the *Strep. viridans* cases. The only important difference is that the individual recurrent phases are in general more severe, and at times are suppurative in nature and require external drainage. These more serious features of pneumococcal parotitis were particularly marked in Cases 8, 9, and 15. In Case 8, that of a woman of 51 with a thirteen-years history, the attacks were severe, bilateral, and frequent, and an external operation had been carried out on the left side. Subsequently the right side had also to be drained. In Case 9, that of a girl of 13 in whom a left-sided parotitis had been present from the age of 1 year and 10 months, there had been five severe attacks and many minor ones. Pus constantly poured into the mouth in large quantity, and the child's physical and mental development was seriously impaired. Operation from within the mouth was followed by complete functional obliteration of the gland and rapid improvement in the patient's health, mentality, and school work. In Case 15, that of a woman of 44 with an eighteen-months history of bilateral parotitis, an external drainage operation had to be carried out for a very severe acute exacerbation, and operation revealed two large abscess cavities in the gland containing greenish-yellow pus.

Recurrent parotitis due to the pneumococcus thus assumes a more serious nature than that due to the *Strep. viridans.* An element of uncertainty exists in every case, and in no case is it possible to say that suppurative complications may not at any stage necessitate external drainage. In the worst cases the parotid swelling may be great, exquisite tenderness is present, the overlying skin is reddened, and there is constitutional disturbance. In no case was there any extension of the pathological process beyond the limits of the parotid fascia.

Chronic.—Only in one case in the series, No. 17, could the condition really be described as chronic. This patient was a man of 45 in whom a right-sided parotitis had been present for nineteen years, and the main feature was the persistence of local symptoms. Even in this patient there had been a history of some exacerbations, and during one of these, two years previously, a parotid fistula had developed, and this was still present when the patient came under observation.

The only important complications occurring during the course of pneumococcal parotitis are abscess formation within the parotid capsule and external fistula formation. These complications have already been considered in the sections dealing with pathology, and clinical types and features.

The Saliva

During the course of the acute cases the parotid saliva, if the duct is patent, is thick, muco-purulent, and yellowish, and does not differ greatly from that found in the *Staph. aureus* cases. In the recurrent cases the gross appearance of the duct saliva is such that, without being actually pathognomonic of the disease, it is highly characteristic, and it is often possible to make a tentative diagnosis from naked-eye examination. This secretion is profuse in amount, greenish yellow in colour, and very thick and tenacious, and it contains a large quantity of mucus. Pus cells and epithelial cells are present, but often not in such large numbers as might be expected. The saliva is in striking contrast to that found in *Strep. viridans* cases, in which it is watery and contains large numbers of very small blobs of muco-pus, an effect which I have called "snow-storm" saliva. The practical value of these observations is that at times it is possible to determine the probable nature of the bacteriological type in any case of recurrent parotitis on clinical grounds alone.

X Rays and Sialography

Plain skiagrams should be taken in every doubtful case of acute parotitis, and in all cases of a recurrent or chronic nature it is essential to exclude the possibility of a calculus, the rare miliary calcification which I have found in association with Raynaud's disease and sclerodermia, and opacities in the vicinity of the parotid. Parotid calculi are, however, rare in comparison with pyogenic parotitis, and although they are almost always accompanied by some degree of infection I have never found a calculus associated with a pneumococcal condition.

Sialography (Payne, 1931) also sheds some light upon the nature and extent of many of the pathological changes in the duct system, and has important bearings upon the question of treatment. These changes are in general of a much grosser type than those found in association with *Strep. viridans* infection, and they may involve the main ducts, the smaller ducts, or the finest ducts and the acini. The typical fine bronchiectasis is found characteristically in the *Strep. viridans* cases, but it is impossible to be dogmatic in this connexion. At the same time sialography, by giving indications of the nature of the duct changes, may indicate the best line of therapeutic approach.

TABLE II.—*A Comparison of Recurrent Parotitis due to the Pneumococcus with that due to the Streptococcus viridans*

	Pneumococcus	Streptococcus viridans
Age	Infancy, childhood, or first half of adult life	Infancy, childhood, or first half of adult life
Sex	Commoner in females ..	Commoner in females
Aetiology ..	Dental factors and imperfect mastication	Dental factors and imperfect mastication
Pathology ..	At times gross duct changes. Tendency to pass into acute phase with abscesses in gland tissue	Duct changes not so gross. No tendency to intra-glandular suppuration
Clinical Features	Recurrent attacks may be very severe and pass on to suppuration, abscess, or fistula formation	Recurrent attacks do not pass on to gross suppuration, abscess, or fistula formation
Saliva.. ..	Profuse, greenish yellow; contains muco-pus	Profuse, watery; contains small blobs of muco-pus
Calculi ..	Not associated	Very rarely associated
Sialograms ..	Segmental or other gross dilatation of major ducts, or irregular dilatation of finest ducts and acini	Typically small globular dilatation of finest ducts and acini
Complications	Abscess formation and external fistula	No tendency to abscess or fistula formation
Prognosis ..	Good as to life. Uncertainty as to the severity of the recurrent attacks	Good as to life. Recurrent attacks do not pass on to suppuration
Treatment ..	External drainage may be required	External drainage not required

Treatment

Pneumococcal parotitis presents many of the therapeutic problems of the other types of pyogenic parotitis. The principles underlying treatment have been discussed in

an earlier communication (Payne, 1938). Because, however, of the element of uncertainty which is inseparable from pneumococcal infections, treatment must be undertaken in the light of the natural history of the disease, and that of the risk of acute complications at any stage of the common recurrent type. Pneumococcal infections of the parotid thus present many of the problems both of acute and of recurrent parotitis. In no case must the treatment of the individual patient be undertaken without the fullest investigation and, so far as possible, a determination of the nature and extent of the pathological changes in the gland and in the duct system. The anatomical situation of the parotid and the important structures which pass through the gland render any drastic surgical procedure out of the question. In the present section the possible lines of therapeutic approach are briefly indicated, and the special points of difference between the therapy of pneumococcal and other forms of pyogenic parotitis are stressed.

Conservative and Local.—During the acute disease or during the acute exacerbations of the recurrent disease the object of conservative and local measures is to maintain or restore the patency of the duct, to empty the duct system of secretion, and to render the secretion more watery. These results can often be brought about by systematic and regular forward massage of the parotid, by duct catheterization, and by the use of external dry heat and frequent hot mouth-washes, and by giving the patient a diet as solid as he can possibly manage in order to maintain parotid function.

Duct Dilatation.—Regular dilatation of the duct may be valuable in those recurrent cases in which there is reason to suppose that the main duct is unduly narrow.

Duct Operation.—This involves a two-stage operation on the parotid duct from within the mouth, followed by prolonged daily dilatation in order to give a wider channel and ensure good drainage into the mouth.

External Drainage.—This will only be required when suppuration and abscess formation are present in the gland tissue. Since it is impossible on clinical examination to determine the site of the abscesses, the exposure of the gland and its drainage should be carried out in exactly the same way as in the cases caused by the *Staph. aureus*, described elsewhere.

Duct Operation and External Drainage.—A combination of these two operations is required when there is evidence of duct obstruction in association with deep suppuration in the gland.

Gland Obliteration.—In some of the worst cases of parotitis functional obliteration of the gland may follow duct operations. This is likely to occur only when parotid secreting tissue has already been largely destroyed by prolonged suppuration. The adequate drainage following operation allows the parotid duct system to become completely obliterated by scar tissue, which extends to and involves the duct orifice. Unfortunately there is no certain means of obtaining this result.

Auriculo-temporal Avulsion.—I have not employed this operation in any of the pneumococcal cases. In a *Strep. viridans* case in which this operation was carried out on both sides there was considerable temporary improvement, but twelve to eighteen months later the nerves regenerated and the symptoms recurred.

Chemotherapy.—In the pneumococcal cases sulphapyridine should certainly be tried, but as yet I have not been able to eradicate an infection by this means. In some of the earlier cases optochin hydrochloride was used as a local bactericidal agent.

Irradiation.—The use of deep *x*-ray therapy is certainly effective in some of the cases of parotitis caused by the *Strep. viridans*, and it is often remarkable how rapidly it acts in reducing a gross degree of parotid enlargement. The *x* rays apparently act by diminishing the secretion of mucus, and this lessens the tendency to duct obstruction. This method is much less certain in its action in the pneumococcal cases, possibly owing to the much grosser changes which are often present in the gland and in the duct system. On these grounds and also because the pneumococcal cases tend to give rise to deep suppuration I believe that *x* rays should be used cautiously. Attempts to produce gland atrophy by means of irradiation are not justifiable.

It is obvious that there is no one single line of attack in these cases of pneumococcal parotitis. Each case must be considered individually in the light of the available evidence. It is also important in all cases to eradicate any local or adjacent cause of infection and to be entirely satisfied about the dental condition and the efficiency of mastication. The dental factor is of paramount importance in the recurrent and chronic cases, and no patient is likely to get rid of his infection unless the function of chewing is normal.

Prognosis

Acute pneumococcal parotitis is never of a fulminating type and the immediate prognosis as to life is always good. The recognition that a case of parotitis is pneumococcal and not due to the *Staph. aureus* should be enough to warrant that the worst features of pyogenic parotitis are unlikely to develop. Most of the acute pneumococcal cases resolve with conservative treatment and usually give rise to no sequelae. In none of the four acute cases here recorded was an external operation necessary, but in one case it was seriously considered. In this case the acute process eventually resolved, but the infection persisted in a milder form. The prognosis in the recurrent cases must be more guarded. In many the course is relatively benign and is similar to that of the *Strep. viridans* cases. But in some the recurrent attacks are of a very severe nature, pass on to suppuration, and necessitate external drainage. These pneumococcal cases possess an inherent element of risk which it is always difficult to assess. The majority pursue a benign course, while the minority pass on to suppuration and to a clinical picture up to anything short of the most fulminating type of *Staph. aureus* parotitis. The prognosis in the chronic cases does not differ from that in the recurrent ones. In the only chronic case in the present series there was the additional complication of an external parotid fistula.

Summary and Conclusions

Pneumococcal parotitis is a clinical entity possessing many characteristic features. It may occur in an acute, recurrent, or chronic form. Bacteriologically the largest group of pyogenic parotitis is caused by the *Staph. aureus*, which gives rise to the acute disease; the second largest group is that caused by the *Strep. viridans*, which gives rise to the typical recurrent condition; while the third largest is that due to the pneumococcus, and this group possesses features of both the acute and the recurrent disease. The pneumococcal group is the least well recognized of the three main types of pyogenic parotitis. The recognition of the bacteriological type in pyogenic parotitis has important bearings upon therapy and prognosis.

A series of seventeen personal cases of pneumococcal parotitis is reviewed, and the aetiology, pathology, and prognosis are discussed. Aetiologically the importance of dental factors is stressed. The recurrent cases may start during infancy, during the period of the second dentition, or during the first half of adult life. The recurrent cases tend to be commoner in females, as is also the case with the *Strep. viridans* group.

The main pathological features are described, and the uncertainty of the course and the tendency to abscess

formation are stressed. The bacteriological findings are summarized. The main features of the acute, recurrent, and chronic forms are described. The largest group is the recurrent one, with some overlap of the other groups into this. The acute cases never pursue as fulminating a course as do some of the *Staph. aureus* ones. In the recurrent group the exacerbations tend to be more acute and more severe than those in the *Strep. viridans* cases, and at times pass unexpectedly on to suppuration within the gland and marked constitutional disturbance.

Suppuration and fistula formation are the only likely complications. In the recurrent cases the parotid saliva is characteristically profuse and tenacious, and contains pus and a large amount of mucus. The sialographic changes are described in the recurrent cases and are usually grosser in type than in the *Strep. viridans* cases. The various lines of treatment are outlined. The main differences between recurrent parotitis due to the pneumococcus and that due to the *Strep. viridans* are summarized.

Prognosis in all cases is good as to life. In the acute group fulminating cases do not occur, and although recovery is the rule the condition may pass into the recurrent phase. In the recurrent group the exacerbations at times tend to be severe, and there is always a considerable element of uncertainty as to the development of suppuration.

On the basis of the evidence presented it is suggested that the natural history of pneumococcal parotitis possesses many characteristics which distinguish it from the other common forms of pyogenic parotitis.

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ANAPHYLAXIS FOLLOWING ADMINISTRATION OF TETANUS TOXOID

BY

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The prophylactic inoculation of man against tetanus was until recent years performed by giving a subcutaneous or intramuscular injection of tetanus antitoxin (3,000 units) during the incubation period of the disease, for preference soon after receipt of a contaminated wound. This procedure aimed at preventing the occurrence of tetanus by neutralizing any toxin formed by the organism, and often necessitated multiple injections at weekly intervals, as the immunity conferred was so short-lived. General reactions, collectively called "serum sickness," followed in about 10 to 15 per cent. of cases injected with sera concentrated by the ammonium sulphate method, and in approximately 2 per cent. of those given the modern refined and concentrated sera prepared by selective treatment with proteolytic enzymes. These reactions were usually of the delayed type, characterized by the occurrence of rashes, malaise, joint pains, and some pyrexia seven to twelve days after the serum had been injected; occasionally, however, when a small desensitizing dose of serum was not given as a preliminary measure, immediate anaphylactic reactions were seen, especially among individuals who had been inoculated with similar heterologous serum at least a week previous, and so had time to develop hypersensitivity to the serum. Briefly, the main drawbacks to this type of prophylaxis were that the immunity given was only passive, partial, and temporary, lasting merely a few weeks, and that serum sickness was a common occurrence.

Advantages of Tetanus Toxoid

To overcome these defects tetanus toxoid was first adopted on a large scale for the protection of man in 1936, for the compulsory inoculation of the personnel of the fighting services in France. In 1938, following the researches of Major J. S. K. Boyd, R.A.M.C., this form of prophylactic inoculation was adopted in both the British Army and the Royal Air Force on a voluntary basis. Boyd's work confirmed the result of similar researches in many countries, notably in France, Germany, and the United States of America—namely, that inoculation with tetanus toxoid had the power to produce an active and relatively permanent type of immunity to tetanus.

To attain this degree of protection two doses of 1 c.cm. of tetanus toxoid are given subcutaneously at an interval of not less than six weeks. This dosage, as Boyd has shown, is as effective as the three-dose method used in France, and produced from 0.1 to 2 units of antitoxin per c.cm. of blood serum within a month of the second inoculation. The amount of antitoxin adequate to protect man against tetanus is, according to Sneath, Kerslake, and Scruby (1937), 0.01 unit per c.cm. of blood serum: this minimum protective quantity of antitoxin has been confirmed by various observers to be present in the blood of man in the majority of instances for a period of two years after immunization. Ramon and Zoeller (1933) found that even up to a period of five years after immunization the blood of man contained enough antiserum to protect against infection with tetanus. This work still requires confirmation; but it can be accepted as proved that for two years after immunization with tetanus toxoid the antitoxin content of the blood can be relied upon either to prevent the occurrence of tetanus or so to modify the infection as to guarantee cure with modern anti-tetanus therapy. Thus it is now possible to protect man against tetanus before exposure to the danger of contaminated wounds, whether in peace or war, instead of after wounding as hitherto.

As regards the danger of reaction following injection with tetanus toxoid, Boyd (1938) stated that the toxoid produces no general or local reaction. This statement was made as the result of limited experience and is correct in the majority of instances, but, from observations made on a large number of Royal Air Force personnel so inoculated, it has been found that general reactions, even to the extent of severe peptone shock or anaphylaxis, may sometimes occur. Thus, in the follow-up of 61,042 individuals immunized by the two-dose method of giving tetanus toxoid, fourteen cases, or 0.023 per cent., showed definite constitutional symptoms, and two of these—that is, 0.0033 per cent., or 1 in 30,521, of those inoculated—had immediate anaphylactic crises, as shown in the accompanying table and detailed below. All these general reactions resulted from the second injection, which was given about six weeks after the first, and came on shortly after inoculation, usually within a half to one hour; it is thought that these reactions were due probably to peptone shock, as individuals subsequently tested by the scratch method showed hypersensitivity to Witte peptone, which was a constituent of the tetanus toxoid administered. The toxoid used in every case recorded here was the standard preparation supplied by Messrs. Burroughs

Wellcome and Co., who inform me that it consists of beef extract containing 1 per cent. Witte peptone, together with the toxin of *Clostridium tetani* rendered atoxic by formalin. Dr. H. J. Parish of the Wellcome Physiological Research Laboratories kindly supplied me with various dilutions of the Witte peptone and beef extract used in the preparation of tetanus toxoid, and of difco proteose. In the three cases tested significant positive skin reactions were obtained with the Witte peptone, but not with the beef extract or difco proteose. Further research is being done at the Wellcome laboratories to determine the exact role of Witte peptone and other ingredients of tetanus toxoid in causing allergic phenomena, as there is some doubt regarding the diagnostic value of the scratch test.

Table showing Incidence of General and Local Reactions following Subcutaneous Inoculation of 61,042 Healthy Individuals with Tetanus Toxoid, using Two 1 c.cm. Doses at a Six-weeks Interval.

Total Number of Persons Inoculated	Acute Anaphylactic Reaction (a)	Definite Constitutional Symptoms (b)	Local Reactions Only (c)
61,042	2 cases (0.003%)	12 cases (0.02%)	651 cases (1.06%)

(a) Anaphylactic shock as described in text.

(b) Constitutional symptoms were mainly frontal headache and pains in body and limbs as in influenza, coming on one-half to one hour after inoculation and lasting about six to eight hours. There was slight pyrexia (99° to 100° F.), shivering, and some complaint of dizziness. Seven of these cases had urticaria of limbs and body.

(c) Local reactions consisted of stinging of the inoculated area for a few minutes, followed by brawny swelling and pain for twelve to twenty-four hours: twenty-two cases had urticarial swelling and itching around site of inoculation for a few hours.

Anaphylactoid reaction the result of peptone inoculation was first described by De Waele in 1907, and appears to be due to some toxic principle peculiar to Witte peptone: Dale (1929) states that this acts as an endothelial poison. Though peptone anaphylaxis is not often encountered in medical practice it is odd that more cases have not been recorded in view of the widespread use of various toxoid preparations of recent years. In fact, the record given above of 61,042 persons inoculated with tetanus toxoid suggests that the incidence of acute (non-fatal) anaphylaxis following toxoid is about 1 in 30,000, which approximates to that following horse-serum inoculations given subcutaneously. It is desirable, therefore, that all those who use tetanus toxoid should realize that the occasional case may suffer from peptone shock, and should be prepared to treat it. For this purpose 1 in 1,000 adrenaline hydrochloride should always be at hand, and, to lessen the risk of anaphylaxis occurring when the individual is alone, injections of tetanus toxoid should be given during working hours, when other people are likely to be about and could summon medical aid should untoward symptoms appear. Moreover, great care should be taken to avoid injecting into a small vein, as this greatly increases the risk of severe reaction. A refinement before giving toxoid would be the application, by means of a skin test, of various dilutions of the brand of peptone contained in the particular make of toxoid, but this is not practicable in most instances.

The following case histories are illustrative of anaphylaxis after the injection of tetanus toxoid.

Case I

A healthy, well-built man aged 52, a swimming-bath instructor, received two subcutaneous injections of anti-tetanus serum (1,000 units) eleven years ago and did not suffer from serum sickness. On November 22, 1938, he was given a second injection of 1 c.cm. of tetanus toxoid forty-four days after the first. The official record made by Dr. W. G. Forde, who attended him, was as follows: "He was admitted to sick quarters at about 5 p.m. (that is, an hour after inoculation with tetanus toxoid). He was then in a state of collapse, suffering from dyspnoea, restlessness, shivering, and intense general pruritus, with frequent bouts of vomiting. The skin was erythematous, the fingers and hands showing patches of a dead white colour, giving a curious marble-like appearance. The man stated later that within a quarter of an hour of the injection he felt his eyes getting hot. He looked in the mirror and saw that his eyes were bloodshot. He then noticed that his lips were becoming very swollen, and had the feeling that his teeth were going to fall out. These symptoms were immediately followed by vomiting, diarrhoea, and loss of consciousness. He does not know how long this lasted, as he lay unnoticed in a lavatory. On recovering consciousness he went out of the lavatory, but soon collapsed again; whereupon he was taken to the sick quarters, where he was detained for an hour; he remembers nothing of his stay there. An injection of 0.75 c.cm. of adrenaline hydrochloride (1 in 1,000) quickly relieved the itching, and within twenty minutes there was a remarkable general improvement."

Subsequently I tested this man for response to a scratch test with various dilutions of Witte peptone and beef extract as used in the preparation of this tetanus toxoid. He gave a distinct reaction to a 1 in 10,000 dilution of Witte peptone, a wheal the size of a sixpence appearing in twenty minutes; a larger wheal occurred in seven minutes with a 1 in 1,000 dilution and did not disappear by the end of an hour. This reaction indicated a high degree of sensitivity to Witte peptone. Tests with beef extract and difco proteose gave negative responses.

Case II

This patient, a healthy airman aged 24, had no history of allergy or of inoculation with other sera or toxoids except with 1 c.cm. of tetanus toxoid forty-six days previously. Inoculated by me in the left deltoid region with 1 c.cm. of tetanus toxoid (second injection) on March 31, 1939, at 10.10 a.m., he returned ten minutes later complaining of dizziness and flushing. There was general swelling of lips, gums, and cheeks, but the inoculated area appeared normal. Beads of sweat appeared on the forehead; the temperature was 99.6° F. and the pulse 90. He quickly became dyspnoeic and vomited twice. He was given 0.5 c.cm. of 1 in 1,000 adrenaline hydrochloride, and during the next fifteen minutes returned to normal, except for erythema and urticaria, which gradually developed over the body and limbs. Mainly the urticaria persisted for eight hours, though a few wheals were present the next day: general itching accompanied the urticaria.

Skin tests in this case gave a positive reaction to a 1 in 1,000 dilution of Witte peptone, a wheal appearing in half an hour.

Summary

Two cases of anaphylactic shock following administration of a second dose of tetanus toxoid are described.

The incidence of general and local reaction following the subcutaneous inoculation of 61,042 healthy individuals with tetanus toxoid, using two 1 c.cm. doses at a six-weeks interval, is reviewed. Anaphylactic reactions occurred in 0.003 per cent. of cases, less severe constitutional symptoms in 0.02 per cent., and local reactions in 1.06 per cent.

Though the incidence of general reaction after tetanus toxoid is rare it is advisable to be prepared to treat it expeditiously with adrenaline hydrochloride when it does occur.

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ANAPHYLAXIS AFTER INJECTION OF TETANUS TOXOID

REPORT OF A CASE

BY

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The following case of anaphylaxis is of special interest in view of the large number of injections of tetanus toxoid that are now being given in this country and abroad. Although allergic symptoms following the administration of this prophylactic are rare, the possibility of their occurrence must not be overlooked, and adrenaline should always be available when injections are given. Over 300 members of our staff received two injections each of 1 c.cm. of tetanus toxoid last summer, the usual interval between injections being six weeks. Reactions both local and general were negligible, the one exception being a case of anaphylaxis after the second injection. Details are as follows:

History of Case

A healthy woman with no known allergic diathesis had received during recent years injections of staphylococcus toxoid, diphtheria prophylactic, and T.A.B. vaccine without showing any allergic reactions. On July 20, 1939, she was given 1 c.cm. of tetanus toxoid deep subcutaneously over the left triceps, the only after-effects being slight stinging and pain down the arm within a few minutes of injection. In our experience these symptoms frequently occur after tetanus toxoid. A second injection of 1 c.cm. was made into the same site seven and a half weeks later—namely, at 3.10 p.m. on September 11, when the patient again had slight stinging and pain down the arm. Within ten minutes she had a pricking sensation round the margin of the anterior half of the tongue and inside the nose. She felt she was "getting hotter and hotter," and soon there was marked flushing of the face and hands. At this stage there were no wheals and no rash. Approximately twelve minutes after injection extremely severe abdominal pain came on suddenly, and rapidly increased until the patient "rolled about in agony." She had an intense desire to micturate and passed very small amounts of urine. Backache was severe, and there was swelling of the lower lip, which passed off quickly. Cold clammy sweat was observed over the face and arms, and speech was incoherent.

When the patient was first seen by us twenty-five minutes after the injection she complained of intense abdominal pain of a cramping character and backache which resembled menstrual pain but was more severe. The injection area was slightly swollen. The pulse was 52, regular, small, and soft. Neither then nor previously was there any respiratory embarrassment, nor were the accessory respiratory muscles in action. Adrenaline 1 in 1,000, 0.4 c.cm., was given within a few minutes. The abdominal pain was much less three minutes later, had practically disappeared in ten minutes, and had gone completely in half an hour, when the patient was mildly excited and wanted to get up. There was no vomiting or diarrhoea. A second examination of the injection area made one hour after the inoculation revealed brawny swelling, but there was no swelling or tenderness of the local lymphatic glands. Ten minutes later flat pinkish wheals (some circular, some pseudopodial, 5 to 20 mm. in diameter) appeared over the inside of both thighs and in the flexure of the elbows, and there was a tendency to wheal formation round the waist. There was fairly marked itching over the wheals, over the scalp, and between the toes. Two hours after the injection of toxoid a scarlatiniform rash with diffuse flushing was observed over the face and hands. A second injection of adrenaline 1 in 1,000, 0.6 c.cm., was given. Later in the evening and during the night the patient had very slight abdominal pain. Six hours after the injection of toxoid the wheals had disappeared, but the diffuse flush remained over the arms and thighs, with blanching at the site of the injections of adrenaline. The itching between the toes persisted longer, and the patient had a general "washed-out" feeling, as after influenza. Next morning all symptoms had disappeared, except the feeling of debility and a sense of constriction round the head. On the second morning after injection the patient was apparently quite well.

Eleven days after the second injection of tetanus toxoid the antitoxin content of the blood was 4 international units per c.cm. This was the highest value in a series of approximately one hundred blood samples taken from members of our staff at intervals ranging from eleven days to seven weeks after the second inoculation.

Discussion

It is customary when considering cases of anaphylaxis to perform scratch or intradermal tests with the antigen and its components in the hope of incriminating some substance as the anaphylactogen. In preparing the tetanus toxoid the medium used for growing the bacilli was an extract of beef to which 1 per cent. of Witte peptone had been added (Dr. F. Witte kindly informed us that the ordinary Witte peptone is made from beef and pork fibrin). Scratch tests were made on the patient's forearms with (*a*) the batch of tetanus toxoid which gave rise to the allergic reaction; (*b*) beef extract and (*c*) Witte peptone, which are constituents of the broth used for the growth of tetanus bacilli; and also (*d*) another peptone—namely, difco proteose. Minute drops of dilutions of these materials were placed on the skin, and superficial abrasions of the areas were made with Hagedorn needles, care being taken not to draw blood and to keep the scratches so far as possible of uniform depth. Additional droplets of the test solutions were then rubbed into the abraded areas with the flat surface of the needles. Dilutions of the four materials, 1 in 10,000, 1 in 1,000, 1 in 100, and 1 in 10, were prepared in borate buffer solution (B.B.S.), and were used in sequence, beginning with the weaker dilutions and continuing with the next stronger dilutions, usually after an interval of some hours. A very small and transient urticarial wheal was observed in the area of the 1 in 1,000 Witte peptone inoculation after approximately eight hours. A slight but definite urticaria developed in the area of the 1 in 100 Witte peptone inoculation within one hour, lasted about one hour, and faded gradually. Larger wheals with more surrounding erythema were observed after 1 in 10 dilutions of Witte peptone and of the tetanus toxoid itself. These reactions appeared within ten minutes, and lasted somewhat longer than the wheal produced by the 1 in 100 dilution of Witte peptone. After 1 in 10 difco proteose a raised erythematous area without urticaria developed within two or three hours and had faded considerably five hours later. The other scratch tests were negative.

At a later date further scratch and also intradermal tests were done on this patient and on a number of persons who had received two injections of tetanus toxoid without showing any anaphylactic symptoms. The reagents included beef, pork, and horse muscle extracts and peptic digests of beef, pork, and horse fibrins, and of other products kindly prepared for us by our colleague Dr. C. G. Pope. It was noted that various dilutions of the digests caused more wheal formation and surrounding

erythema than similar dilutions of the extracts, and that within a few minutes of injection many persons developed reactions to these test products and to Witte peptone at least as severe as those shown by our anaphylactic case. Further investigations are in progress which it is hoped will be the subject of another paper. Our observations throw considerable doubt on the value of scratch and intradermal tests as usually interpreted on the basis of early readings. Nevertheless, our patient was the only subject who developed mild anaphylactic symptoms—itching of the nose and tongue, slight swelling of the lower lip, smarting of the eyes, and flushing of the face—soon after 1 in 1,000 dilutions of Witte peptone and two other beef fibrin digests had been injected intradermally; and she alone showed areas of redness, 50 to 60 mm. in diameter, swelling, and induration ("like those occurring after staphylococcus toxoid") about two hours later at the sites of injection of these products. These "late" reactions were at their maximum about this time and faded completely during the next three hours.

We feel, therefore, that Witte peptone may be the substance in tetanus toxoid to which the patient had become sensitive. Some degree of sensitivity to Witte peptone may be more common than is generally supposed: Parish (1936) and Bousfield (1936) reported cases in this country and referred to others in America in which allergic reactions had followed the use of Schick test fluids, which at that time were stabilized by Witte peptone.

The patient in the present inquiry had received two courses of staphylococcus toxoid—in May, 1937, and January, 1938. In view of the high content of Witte peptone in the medium in which the staphylococcus toxin was prepared it was thought that sensitization to the peptone might have been acquired by the repeated injections of staphylococcus toxoid. The patient, however, had tolerated the first injection of tetanus toxoid in July, 1939, which led to the suggestion that it was this injection that had caused the sensitization. We have heard of other allergic reactions after second injections of tetanus toxoid. These manifestations appear to be rare and readily controlled by the injection of adrenaline. It would seem advisable to keep all persons injected with tetanus toxoid under observation for at least half an hour.

Summary

A case of anaphylaxis after the injection of tetanus toxoid is described.

Allergic phenomena, though alarming, appear to be rare, and are due to some constituent of the medium in which tetanus toxoid is prepared, possibly the Witte peptone.

Adrenaline 1 in 1,000 should always be readily available as a precautionary measure when tetanus toxoid is injected.

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MARCH FRACTURE—PIED FORCÉ

BY

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Army medical officers everywhere have been asked to see all sorts of foot troubles precipitated by military training. More often than not these are due to pre-existing conditions such as hallux rigidus, hallux valgus, hammer-toe, or pes planus, which, though formerly symptomless, break down under the strain of route-marching, physical training, and the general extra footwork the soldier is called upon to do in heavy army boots. Even a seemingly normal foot may develop trouble under such circumstances, and none is more dramatic in onset or crippling in effect than the so-called march fracture. This short paper records three cases admitted within the first two months of the war to what was probably the first Territorial general hospital to function. So little is said of the condition in the textbooks, and so puzzling may it prove at the beginning, that no apology is necessary for reporting these cases.

Case I

A medical officer, aged 41, while walking along a corridor at about 10 a.m. one day, felt discomfort in the outer part of the forefoot. Within half an hour this amounted to frank pain, and by lunch time he was forced to walk with a marked limp; yet he is satisfied that there was no trauma, sudden strain, or unaccustomed activity, at any rate within several hours previously. On examination there was tenderness on deep pressure on the dorsum of the fourth interosseous space just behind the heads of the metatarsal bones, and weight-bearing, especially on the outer border of the foot, was very painful, though all discomfort ceased with rest. Next day the situation was much the same, but a slight puffiness appeared in the fourth interosseous space at the site of the tender point, and the enforced gait of walking on the inner border of the externally rotated foot produced the added discomfort of peroneal strain. By the third day oedema of the dorsum was sufficient to hide the extensor tendons of the toes, and weight-bearing was so painful that had he not been able to do his work at his own pace he would have been forced to "go sick." The diagnosis of march-foot was considered, even though there had been no question of long marching and in spite of the fact that the only sign mentioned by textbooks as characteristic—namely, pain on pulling on the toe of the affected metatarsal—was absent; moreover, an *x*-ray picture failed to reveal any bony abnormality. Two other signs, however, developed—pain on pushing the third toe axially backwards on to the metatarsus, and tenderness on pressing the plantar surface of the head of the third metatarsal; the dorsal tenderness in the fourth interosseous space was still present. The condition remained much the same until a fortnight after the onset, and then walking became less painful provided it did not exceed fifty yards. By the end of a month about a mile could be covered without pain, after which severe aching in the fourth interosseous space ensued and an occasional click was sensed in this region. A second *x*-ray picture, taken at this stage, showed callus round a transverse crack in the neck of the third metatarsal bone. About a week later the oedema in the dorsum began to subside, and a more localized swelling, corresponding to the callus, remained. It was seven weeks before full activity was completely painless, and ten before the extensor tendons were unmasked by residual thickening of the soft tissues.

The second and third cases were admitted on the same day, about a month after the first, and each had developed symptoms a few days before admission.

Case II

A healthy Class A infantryman, 22 years old, stated that a week previously he had developed discomfort in the outer part of the front of his left foot, and that within two hours the pain caused by walking was so great that he had to report sick. Though his training included route-marching he had done none, nor any other violent exercise, within thirty-six hours of the onset of the trouble. There was nothing to see at the time, but the medical officer discovered a tender point in the dorsal part of the fourth interosseous space and ordered him to rest. In spite of this the pain continued on any attempt at walking, and he was therefore sent to this hospital. On examination tenderness was found on deep pressure on the dorsal aspect of the fourth interosseous space, tenderness on the plantar aspect of the third metatarsal bone, pain on pushing the third toe backwards on to the tarsus but none on pulling it away from the tarsus, and moderate oedema of the dorsum of the foot hiding the extensor tendons of the toes. The patient was kept in bed and given massage treatment, but as the latter caused pain it was withheld for a fortnight and then restarted. The case was so exactly parallel with the first one that a second radiograph was taken at the end of two weeks from the onset, but still no unmistakable lesion was shown. Progress continued to be satisfactory, and by the end of three weeks he was put on massage again, and this no longer caused pain. Still having in mind the first case, a third radiograph was taken, and this revealed a tiny crack of the neck of the third metatarsal bone surrounded by a collar of callus. The patient was allowed to walk about the building at the end of five weeks, and returned to his unit at the end of seven. The general oedema of the dorsum had disappeared, and the last evidence of the lesion was slight thickening corresponding to the callus.

Case III

This patient was also a healthy infantryman 22 years old. His story was that towards the end of a session of physical training he felt discomfort in the anterior part of the right forefoot which rapidly developed into real pain on any attempt to walk. He reported to the medical officer and was taken off duty, but as no improvement ensued he was sent to this hospital. On examination there was tenderness in the fourth interosseous space and over the third interosseous bone. Pulling the third toe away from the tarsus caused pain. There was slight oedema of the dorsum of the right foot as compared with the left, but this was not so marked as in the first and second cases. A radiograph showed an oblique fracture of the shaft of the third metatarsal bone with no displacement. The foot was put in plaster-of-Paris with a Böhler iron for one month, and after massage for a further fortnight the patient returned to full duty.

Comments

If march-foot is defined as a spontaneous fracture of a metatarsal bone during prolonged marching two of these cases would have been missed, for it was not until the second *x*-ray pictures were taken three weeks after the first that the tell-tale callus declared the true diagnosis of a condition that up till then had been most puzzling; and it is almost certain that these second radiographs would never have been taken had not I myself been Case I, and been stimulated constantly by the annoyance of the disability to believe that no stretching of ligaments could possibly account for all the symptoms. From the radiographic appearances in Cases I and II at the third week the lesion seems to be a subperiosteal transverse crack of the neck of a metatarsal bone. The site of tenderness in the interosseous space rather than over the bone in these two cases is difficult to explain, unless it be that tearing of a periosteal nerve is referred back to the interosseous nerve, which it joins.

Conclusion

The case showing an oblique fracture at the first *x*-ray examination offers no problem. Where the history is that of spontaneous discomfort in the forepart of the foot, developing within an hour or so into frank pain with any attempt at weight-bearing; local tenderness in the interosseous space, followed within a day or so by puffiness of the space which spreads to involve the whole dorsum, so burying the extensor tendons; and complete freedom from pain on resting the foot—these signs and symptoms, even in the absence of immediate *x*-ray evidence, should make one very suspicious of a subperiosteal crack of one of the metatarsal bones, and the radiograph should be repeated in three weeks. In the meantime complete rest in bed is the quickest method of restoring the patient to normal.

AEROPHAGY

BY

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The habit of swallowing atmospheric air by gulping so as to distend the stomach becomes noticeably commoner in the nervous individual in times of personal anxiety or of national stress like the present, particularly in women during the climacteric—and sometimes, though seldom, in men about the same period of life—and can excite much discomfort, even pain, with more or less constant complaint of ailing. The condition occurs in those given to worry and anxiety of an imaginary or trifling kind, being an actual gastric neurosis. Such persons readily suffer from nausea, the sialorrhoea thereby provoked causing the frequently repeated act of swallowing saliva with atmospheric air into an empty stomach so as to distend it. In its turn this distension forbids the taking of food. As a rule, however, such patients are never anorexic but well nourished and stout.

Once the habit is established air-gulping is often practised almost paroxysmally for half an hour or so at a time, or until the patient tires of the physical efforts at swallowing and produces a comforting sensation of gastric repletion akin to that of a full meal, this feeling becoming one of discomfort only when the distension of the stomach is excessive.

Complaints of "wind" or flatulence seem to be more often than not due to this habit. To diagnose the condition, apart from the usual physical signs of an overdistended stomach with occasional borborygmi to be heard as air rattles on through the pylorus, all one need do is to ask the patient: "Let me hear the wind." The process can then be observed. What the patient does is to crane the neck; then she proceeds to gulp air, at the same time complaining of tightness and pain across the epigastrium. She then straightens the neck and eructates noisily, so obtaining relief. A similar phenomenon can be witnessed in the mentally deficient child given to the practice of "rumination," or in the ruminating cow that "chews the cud." But not all women who practise aerophagy suffer from that neurosis alone. Some few are reflexly dyspeptic: they may suffer from chronic cholecystitis or gall-stones, this constituting the underlying disposing cause of the habit.

The treatment of air-gulping is simple: to stop or prevent the actual process of gulping, a small rubber

gag or cork should be placed between the back teeth on one side and secured by an attached silk thread wound round the pinna of the same side. Few of those afflicted relish this cork cure, preferring the sympathy excited by their complaint and the gastric comfort—or discomfort—of air-gulping. Preventive treatment is simple: if the trick and habit are explained to the patient, and advice is given as to correct and regular feeding, no meal being missed so as to create an empty stomach, this may then be all that is required. It will be well, however, to look carefully for gall-bladder mischief, which, if found, should be corrected.

Dilatation of Stomach

In a few cases it seems pretty certain that the habit of air-swallowing is learned during convalescence in bed after confinement or illness or operation. A fluid diet is usual at this time, swallowed in gulps while recumbent. In this way the habit may be quickly discovered by the neurotic. However, not all "aerophagists" are neurotic. In a class apart are those patients after laparotomy—at any age, male or female—who, because of nausea, extreme thirst, or dry tongue and mouth, repeatedly go through the act of swallowing saliva and air together so as to obtain some relief. Thirst is assuaged by the nurse giving to the supine patient sips of water out of a teaspoon or mug, or pills of ice to suck, so encouraging chance air-swallowing. Much air may thus find its way into the silent, perhaps passive, stomach, which then becomes distended, being unable, because atonic, to empty itself by the act of eructation or else by peristalsis driving the atmospheric air on through the pylorus.

Where such a state of affairs occurs an acute dilatation of the stomach may ensue. Indeed, I am convinced that such is the dire consequence of the unwitting swallowing of atmospheric air which cannot be given vent to readily by the patient because recumbent. This being so, it may not be advisable as a first effort to attempt to recover gastric tonus by the hypodermic use of such substances as pituitary extract, or acetylcholine, eserine, or doryl, until an attempt is made to empty the stomach of air by means of a retained Lyon tube, which, being passed, will evacuate what air is in the stomach as well as prevent further air entering. At the same time the patient should be placed in the Fowler position and over on to the left side so as to give vent to air pocketed in the cardiac end of the stomach.

Conclusions as to aerophagy conclude nothing. It is merely a symptom—an effect rather than a cause; one type, embracing the majority of cases, being harmless, the other harmful—maybe desperately so—in the result: these two types of similar mechanism of production—namely, in the first case by air-gulping into an actively contractile stomach possessing the power to expel swallowed air upwards by way of the oesophagus or downwards through the intermittingly relaxed pyloric sphincter; and in the other case by air-swallowing into a passive, dangerously atonic stomach—often leads on to a fatal issue by an uncontrolled acute gastric dilatation.

Intra-laryngo-tracheal Goitre.—Different views as to the causation of goitre appearing in the submucous tissues of the larynx and trachea are reviewed, with the relevant evidence from histological examination of human and rat (experimental) goitres. A connexion with the ordinary extra-laryngeal thyroid tissue is usual.—Pathogenesis of Intra-laryngo-tracheal Goitre. C. Wegelin.—*Schweiz. med. Wschr.*, July 1, 1939, **69**, 593.

THE WEAK "A" REACTION FOUND IN SOME CASES OF THE BLOOD GROUP "AB"

BY

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It is well known that the reactions of the agglutinogen A with anti-A serum are often markedly weaker when that antigen occurs with B in Group AB than when it occurs alone in Group A. Thomsen (1929) and Thomsen, Friedenreich, and Worsaae (1930) have shown that in some AB cases the factor B is partially dominant to and obscures the A antigen. While there tends to be some weakening of the B reaction in Group AB, it is nothing like so marked or so important as is the suppression of A. As there are two types of A antigen—A_1 and A_2, a stronger and a weaker—the suppression of B by an already weak A_2 in the Group A_2B may result in it only being possible to detect the A factor with powerful anti-A serum; weaker sera of only moderate strength will often fail completely to reveal this A factor, and the cells will be diagnosed as belonging to Group B. Cases diagnosed as B have been found on re-examination to belong to Group AB, and an inspection of published figures from all parts of the world shows that in a large proportion of the series there is a real deficiency of the numbers in Group AB.

In the accompanying table are given in full the results of titrating against standard cells of the types A_1, A_2, A_1B, and A_2B, consecutive anti-A (α) sera from fifteen persons, bled because their sera had been found to contain the antibody in amount sufficient to satisfy the minimum requirements of this Unit—a titre of at least 64 with standard A_1 cells. The technique used for these titrations has been described by Taylor and Ikin (1939). Although we feel that the use of an anti-A serum with a titre of 64 would be justified if a stronger one were not available, we prefer a higher titre; and, while anti-A sera with titres of 64 are being stored in case they are needed at a time when the demand may be very great, stronger ones are being sent to those who apply to us for grouping serum.

Of the sera from 378 persons of Group B, 111 (29.37 per cent.) had titres of at least 64. Only 31 (8.2 per cent.) had titres of 128 or more, and, as Group B forms about 9 per cent. of the English population, it has been necessary to explore some 4,200 people to get thirty-one adequate sera—that is, only 0.74 per cent. of the population provided really good anti-A serum.

As the factor B does not occur in strong and weak forms, anti-B (β) serum with a titre of at least 64 with standard B cells seems to be adequate; 1,347 persons of Group A yielded sixty-seven satisfactory sera—that is, 4.97 per cent. of all A's, or 2.19 per cent. of the whole population, assuming that Group A is 44 per cent. thereof.

Apart from the A_1B cells used with serum 13 the four donors of the control cells were always the same persons, and the table shows that the order of decreasing strength of reaction is A_1, A_1B, A_2, A_2B. This same gradation in strength, A_1, A_1B, A_2, A_2B, was also evident in the comparative reactions given by cells from large numbers of

Results of Titrating against Standard Cells Consecutive Anti-A (α) Sera from Fifteen Persons

	1				2				3				4				5			
	A_1	A_2	A_1B	A_2B	A_1	A_2	A_1B	A_2B	A_1	A_2	A_1B	A_2B	A_1	A_2	A_1B	A_2B	A_1	A_2	A_1B	A_2B
1/1	C	V	C	++	C	V	C	++	C	V	C	++	C	V	C	+	C	V	C	+
1/2	C	V	C	+	C	++	C	++	C	V	C	+	C	V	C	(+)	C	++	C	(+)
1/4	V	++	C	+	V	++	V	+	C	++	C	(+)	V	++	V	w	C	++	V	w
1/8	++	++	V	w	++	++	++	w	V	+	V	w	V	(+)	++	−	V	+	V	−
1/16.. ..	++	+	++	−	++	+	++	−	++	(+)	++	−	+	(+)	+		++	(+)	++	
1/32.. ..	+	w	++	−	++	(+)	++	−	+	−	+		(+)	−	w		++	−	w	
1/64.. ..	(+)	w	(+)		(+)	−	(+)		(+)		(+)		w		−		+			
1/128 ..	w	−	w		w		−		w		−		−				(+)			
1/256 ..	−	−	−		−				−								−			
1/512 ..	−		−																	

	6				7				8				9				10			
	A_1	A_2	A_1B	A_2B	A_1	A_2	A_1B	A_2B	A_1	A_2	A_1B	A_2B	A_1	A_2	A_1B	A_2B	A_1	A_2	A_1B	A_2B
1/1	C	V	C	++	C	++	C	++	C	V	C	++	C	V	C	+	C	C	C	++
1/2	C	V	C	(+)	C	++	V	(+)	C	++	V	+	C	++	C	(+)	C	V	C	++
1/4	C	++	V	(+)	V	(+)	V	−	V	(+)	V	w	V	++	++	−	C	V	V	+
1/8	V	+	++	−	V	w	++		V	w	++	−	V	+	++		V	++	V	+
1/16.. ..	++	(+)	++		++	−	+		++	−	+		+	w	+		V	(+)	++	w
1/32.. ..	++	w	+		++		(+)		+		w		(+)	−	w		++	−	++	−
1/64.. ..	(+)	−	w		(+)		−		w		−		w		−		+		w	
1/128 ..	w		−		−				−				−				w		−	
1/256 ..	−																−			
1/512 ..																				

	11				12				13				14				15			
	A_1	A_2	A_1B	A_2B	A_1	A_2	A_1B	A_2B	A_1	A_2	A_1B	A_2B	A_1	A_2	A_1B	A_2B	A_1	A_2	A_1B	A_2B
1/1	C	C	C	++	C	V	C	(+)	C	V	C	++	C	V	C	V	C	V	C	(+)
1/2	C	C	C	++	V	++	V	(+)	C	++	V	(+)	C	V	C	++	C	++	V	w
1/4	C	V	C	++	V	++	++	w	V	++	V	w	C	V	V	++	C	++	V	−
1/8	C	++	C	(+)	++	(+)	++	−	++	(+)	++	−	V	++	V	(+)	V	+	++	
1/16.. ..	C	++	V	(+)	++	(+)	+		++	−	(+)		V	(+)	+	−	++	w	++	
1/32.. ..	V	++	++	−	+	−	w		++		w		++	w	(+)		+	−	+	
1/64.. ..	++	w	++		(+)		(+)		(+)		−		+	−	w		(+)		w	
1/128 ..	++	−	(+)		w		−		−				w		−		−		−	
1/256 ..	(+)		−		−								−							
1/512 ..	−																			

No reaction is scored as negative without a microscopical examination; reactions weaker than V were determined with a microscope.
C = clumps of cells in clear surrounding fluid visible to naked eye.
V = somewhat weaker reaction, with clumps distinctly visible to naked eye, although surrounding fluid is not clear.
++ = very big clumps under microscope; + = not quite such big clumps; (+) = less than +.
w = definite weak reaction in which there is a uniform distribution of very small clumps of about six to eight cells.

other donors examined. With none of the fifteen sera was the A_2B reaction very big, and with many it was very small indeed. With each serum tests were also made by the slide method, and while a reaction with A_2B cells was always found, it was sometimes very trifling and delayed, and difficult to see with the naked eye. It was quite evident that even with sera that might well be considered to be of good strength the greatest care is necessary if some AB cases are not to be diagnosed as B.

Even the examination of the serum for antibodies would not necessarily disclose that a case diagnosed as B was really AB, for the serum from quite a number of A_2B cases contains the antibody α_1, which reacts with A_1 but not with A_2 cells, and if this serum were mixed with test-cells of the type A_1 a reaction would result and seem to confirm the diagnosis of Group B. As the antibody α_1 does not react with A_2 cells the testing of the serum of all apparent B's with A_2 cells should prevent an A_2B being mistaken for a B; for if a person's serum contains the antibody α, which reacts with both A_1 and A_2 cells, that person's cells cannot be either A_1B or A_2B.* The sera of all B persons examined by this Unit are tested with A_2 cells.

Very occasionally AB cells are diagnosed as A; this mistake ought never to occur, and can only be due to the use of an anti-B serum which is far too weak.

Summary

Copies of protocols are given which illustrate how weakly some AB cells react with anti-A serum, and it is shown that certain persons of Group AB may easily be diagnosed as B.

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* This test would fail to disclose the A factor in the unlikely case of an A_1B person, misdiagnosed as B, whose serum contained the rare agglutinin α_2 (anti-O). Testing all reputed B's with both O and A_2 cells would eliminate this source of error, and, of course, there would be no reaction with A_1 cells.

Clinical Memoranda

Pneumococcal Peritonitis and Appendicitis with Perforation, treated by Operation and Sulphapyridine

The following case may be considered to be of interest for several reasons.

CASE REPORT

A female child aged 8 was admitted to the Children's Hospital, Temple Street, Dublin, under my care on March 28, 1939, as an "acute abdomen." Forty-eight hours previously she became ill with abdominal pain and vomited. The mother administered a dose of syrup of figs, and the patient was well enough to attend school the following day. Just before admission she had again complained of sudden violent abdominal pain and vomited several times.

On admission the child was acutely ill and had a cyanosed appearance. She was very shocked; her temperature was 101°, pulse 140, and respirations 32. Examination showed marked uniform tenderness and rigidity of the whole lower abdomen, with dullness below the umbilicus. Nothing abnormal was found on examination of the lungs, and no sign of vaginal or rectal inflammation was seen.

Operation was performed immediately, the abdomen being opened by a right subumbilical paramedian incision. There was a large quantity of sero-purulent fluid in the peritoneal cavity. The absence of *B. coli* odour and the appearance of the exudate suggested pneumococcal infection. On examination of the right iliac fossa a large mass of adherent omentum and small bowel was found, and digital separation of adhesions disclosed an acutely inflamed appendix with a perforation in the distal third. The appendix was removed and the abdomen closed with a stab drain through the right loin. Following operation the child was treated with sulphapyridine (M & B 693), one tablet four-hourly, and continuous rectal salines. The culture from the exudate showed a pure pneumococcal infection. The next evening the child was definitely improved, the temperature being 99.4°, pulse 130, and respirations 30. Cyanosis was still pronounced. Forty-eight hours after operation the temperature was normal, pulse rate 128, and respirations 28. The temperature and pulse remained normal and the child made an uneventful recovery, with rapid absorption of the exudate. The tube was removed twenty-four hours after operation. The patient was discharged five weeks after admission quite fit and able to be about.

This case is of interest because of: (*a*) The possibility of the appendix being the primary organ affected in cases of pneumococcal peritonitis. The history of the findings suggests that the appendix was the causal organ. (*b*) The importance of laparotomy in all cases of suspected pneumococcal peritonitis. Any palliative treatment in the presence of perforation would undoubtedly have meant disaster. (*c*) The value of sulphapyridine in cases of pneumococcal septicaemia; the favourable course of this case after operation was undoubtedly due to the administration of the drug following removal of the appendix, which seems to have been the portal of entry for the abdominal infection.

The condition was acute primary pneumococcal peritonitis with acute pneumococcal appendicitis. The literature is vague on the mode of infection of the peritoneum in such cases. The absence of vaginal discharge or inflammation probably excludes infection by way of the genital tract.

I wish to acknowledge the assistance given by Dr. Gaffney and to thank Dr. Farrington for the pathological examinations.

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Bilateral Traumatic Rupture of the Diaphragm

The following case is interesting and rare enough to merit publication.

CASE REPORT

The patient, a lorry driver aged 33, halted on a steep incline at night to help a fellow driver adjust his fog lights. While both men were busily engaged on one lorry, the other moved backwards unnoticed. The two vehicles collided and pinned the patient before he could get clear. The force of the impact caught the lower side of the right thorax anteriorly and the abdomen. Death followed immediately.

Post-mortem Findings.—The body was that of a normally developed and well-nourished man. External signs of severe injury were absent, except for a superficial graze 2½ by 1½ inches on the right side of the chest wall on the anterior axillary line over the tenth rib and a small circular bruise 1 inch in diameter to the left of and slightly below the umbilicus. When the abdomen was opened a rupture of the diaphragm was found. A tear 7½ inches in length was seen in the left cupola of the diaphragm, through which the stomach, spleen, and omentum had prolapsed into the left pleural cavity. This rupture had occurred through the muscular portion quite close to its costal attachment. A second rupture 2 inches in length was discovered in the right cupola close to the vertebral column. The diaphragm appeared to be well developed and showed no evidence of congenital abnormality. There was a large amount of blood in both pleural cavities, but no perforating wound of the lungs was found. On the right side the tenth, eleventh, and twelfth ribs were fractured in the posterior axillary line, and the seventh rib at its anterior cartilaginous end. There was much intraperitoneal and retroperitoneal haemorrhage; but a significant fact was the absence of gross damage to any of the solid or hollow viscera—a finding which might reasonably have been expected. The myocardium and coronary arteries revealed nothing of pathological interest; the intracranial contents showed no evidence of damage; and there was no fracture of the spinal column, long bones, or extremities.

COMMENTARY

Traumatic rupture of the diaphragm as a result of gunshot and stab wounds is fairly common in war time, but traumatic rupture due to increased intra-abdominal pressure raised momentarily to this degree must be regarded as a rarity.

The interesting points in this case are: (1) The few external signs, such as bruising and laceration, that were present on the body despite the degree of compression to which the abdomen must have been subjected in order to raise the intra-abdominal pressure enough to cause such an extensive rupture of the diaphragm. The absence of bruising and rupture of the abdominal musculature could be explained away if the patient happened to have been taken unawares before the muscles had sufficient time to be on their guard. (2) The absence of rupture of any of the intra-abdominal solid or hollow viscera. The contributing factor here was, undoubtedly, the early rupture in the diaphragm which produced an outlet for the much-raised intra-abdominal tension.

I am indebted to Dr. W. Stewart, pathologist to the Herefordshire General Hospital, for his assistance.

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Schmidt's Tonsil Reaction.—Changes in the leucocyte count of the peripheral blood were studied after massaging the tonsils. In normal cases a leucopenia was shown, but in most cases of chronic infection of the tonsils there was a leucocytosis.—Results of Investigation of Mechanical Tonsil Reaction of Schmidt. H. G. Heyer.—*Arch. Ohr., Nas., u. KehlHeilk.*, June 23, 1939, **146**, 111.

Reviews

CLINICAL PSYCHIATRY

Modern Clinical Psychiatry. By Arthur P. Noyes, M.D. Second edition, rewritten and enlarged. (Pp. 570. 22s. 6d. net.) London and Philadelphia: W. B. Saunders. 1939.

This book is a clearly written, simple account of clinical psychiatry in the tradition of the Meyerian teaching which has come to have much influence not only in America but in the British Isles. It bears a distinct resemblance, but in a simplified way, to a predecessor in the same field. It does not neglect, however, to take account of the teachings of other schools, and draws on the doctrines of Freud, Jung, Janet, Kraepelin, and Kretschmer. Being essentially a student's book, it gives only general accounts of some of the theories associated with these names.

The chapters follow the usual rule, but there is a full chapter on psychiatry and general medicine, which contains, among other things, some wise clinical advice on the problems of convalescence. Conspicuously absent are any reference to child psychiatry—a curious omission in a modern textbook of mental diseases—and any discussion on the medico-legal problems that are so important and interesting a part of psychological medicine. The student will look in vain for guidance on how to get a patient into a mental hospital. The newest methods of treatment are described, but little attempt is made, perhaps wisely at this stage, to evaluate their usefulness. Of cardiazol the author says that no patient should be considered as hopeless till after twenty convulsive shocks have been induced. Some will consider that caution would dictate cessation of the attempts at cure if there is no result at all after ten or twelve convulsions. The only contraindications mentioned are the vertebral fractures reported by certain authors (although the significance of these reports is still *sub judice*). Nothing is said of the possibilities of cerebral gliosis or of an effect on memory.

LOOSE-LEAF OTOLOGY

Loose-Leaf Medicine of the Ear. Edited by Edmund Prince Fowler, jun., M.D., ScD. With a foreword by John Devereux Kernan, M.D. (Pp. 590; 350 illustrations and 2 four-colour plates. £3 6s.) New York and Edinburgh: Thomas Nelson and Sons. London: H. K. Lewis and Co., Ltd. 1939. (European Agent: Alfred G. Hassing, Politikens Hus, Raadhuspladsen, Copenhagen, Denmark.)

Messrs. Thomas Nelson and Sons have now produced *Medicine of the Ear*, a volume complementary to *Surgery of the Ear* in the loose-leaf series. This, like its fellow, is a compilation of a large number of articles by various contributors, and the editing has been in the hands of Dr. Edmund Prince Fowler, jun., of New York. The contents of this volume display a much higher standard, both literary and scientific, than those of the volume on surgery, and they show (as the editor indicates in his introduction) that otology is no longer so dominated by surgery as it has been in the past. The work put forward is good evidence of the truth of this statement, for the physiological, pathological, and clinical researches which are aptly embraced in the term "medicine" and here described are of the highest order.

Some of the articles are outstanding, and among these may be mentioned the physiology of the equilibrial labyrinth by Professor John Tait and the pathology of the labyrinthine capsule by Professor F. Nager. In the first of these Tait gives an account of his researches with McNally into the functions of the equilibrial labyrinth under two categories—propriation and "servation"—the first referring to the special features in virtue of which the particular receptor is enabled to respond to its own mode of stimulation; the second referring to the general service of the sense organ to the animal—that is to say, the local mechanism is propriation, the use of the organ is servation. Under these two headings a lucid and fascinating account of labyrinthine physiology is presented. The researches of Nager into the pathology of the labyrinthine capsule were undertaken with the object of elucidating the problem of otosclerosis. The research spread far beyond this boundary, and the changes which occur in many other conditions, such as cretinism, osteitis deformans, and achondroplasia, are carefully described and correlated so far as possible with their clinical manifestations. Professor Nager has gathered into a comparatively short article the results of a wide histological study of a particularly difficult character.

Besides these two articles, which are almost entirely based on the personal researches of the authors, there are particularly good sections on congenital malformations of the ear by Altmann, deafness from drugs and chemical poisons by Taylor, and traumatic deafness by Bunch. There is also a particularly helpful and sympathetic section on the management of the deaf and hard of hearing by Gordon Berry. It overlaps a little with the section on deaf-mutism by Max Goldstein, but both are excellent. This by no means exhausts the material to be found in this book, which does immense credit to the editor, who is himself by no means the least of the contributing authors.

CONGENITAL GLAUCOMA

Hydrophthalmia or Congenital Glaucoma: Its Causes, Treatment, and Outlook. By J. Ringland Anderson, M.C., M.D., B.S.Melb., F.R.C.S.Ed., F.R.A.C.S., D.O.M.S.Lond. With a foreword by Sir John Herbert Parsons, C.B.E., D.Sc., F.R.C.S., F.R.S. (Pp. 378. 25s. net.) Cambridge: Published for the *British Journal of Ophthalmology* at the University Press. 1939.

For many years there was a tendency to regard all congenital lesions of the eye as the result of intra-uterine inflammation. The development of genetics has of late tended to emphasize the chromosomal basis of such lesions, while experimental embryology has brought yet another approach. So far these different approaches have contributed but little to a comprehensive view, each being apparently exclusive of the other methods of approach. These difficulties are reflected and fully recognized in Dr. Anderson's excellent monograph on congenital glaucoma. In a comprehensive survey of the literature he brings out an undoubted hereditary factor, much evidence for such protoplasmic poisons as the spirochaete, and, on the basis of his own studies, evidence that the phylogenetic history of the drainage paths in the eye is a factor to be considered. On the genetic aspect there are such facts as that the incidence of the affection falls heavier on males than on females, and that in hereditary cases both eyes are affected with a greater frequency than in sporadic cases. The phylogenetic history of the eye shows that in attaining the unequalled range of accommodation seen in man profound modifications in the canal of Schlemm have occurred, and that this recent modification may easily be disturbed disadvantageously by relatively slight extraneous or hereditary influences. While it is difficult to assess the significance of histological changes previously

regarded as evidence of intra-uterine inflammation, the author does well to emphasize that a local patch of inflammation, due to some general infection, may be the underlying cause of what are apparently developmental defects in the narrower sense. These are all real difficulties, and the problem is not made easier by recent work on the relation of endocrines to chromosomes.

A clear clinical picture emerges from the present study. Dr. Anderson can find no evidence for the existence of an innocent megalophthalmia, and he points out that the differential diagnosis from congenital myopia and megalocornea is not a difficult matter, particularly from the practical aspect, as mild cases of congenital glaucoma where such a difficulty might arise do not call for treatment. Though it is clinically a clear-cut entity, congenital glaucoma presents puzzling pathological problems. If early cases are studied the anatomical lesion would seem to be the absence of the canal of Schlemm or undue development of the meshwork of the angle. The frequent association with facial naevi and facial neurofibromatosis appears to find its explanation in an anomalous state of Schlemm's canal from involvement of the ciliary nerves and the presence of angiomatous changes in the uveal tract.

That increase of tension is an essential feature in congenital glaucoma is stressed throughout this book, and the author attaches the utmost importance to early operation. At their best, results are not good; 25 per cent. of operated cases and 54 per cent. of unoperated cases in a large series were blind by the age of 12 years, and the best late results were obtained by operation on infants between 7 and 9 months. The prognosis was particularly bad in cases with neurofibromatosis. Of the large variety of operations trephining seems to be the most popular, though the author hopes much from the goniotomy operation recently introduced by Barkan. A puzzling and distressing feature is the occurrence of death from anaesthesia in these infants—not infrequently reported in such cases.

This book is the fullest study on the subject thus far published. It is likely to remain the standard work for many years, for Dr. Anderson has clarified a difficult field of study and made further advance easier.

HUMAN MICROSCOPICAL ANATOMY

Human Histology. A Guide for Medical Students. By E. R. A. Cooper, M.D., M.Sc. With a foreword by F. Wood Jones, F.R.S., F.R.C.S. (Pp. 424; 237 illustrations. 16s. net.) London: H. K. Lewis and Co. 1939.

This is a book written and illustrated with the view of providing a reliable work on human microscopical anatomy, as contrasted with many previous works on the same subject, in which the material used for the illustrations has been largely obtained from lower mammals, amphibians, and even invertebrates. The illustrations in Dr. Eugenia Cooper's manual have been admirably reproduced from photomicrographs of sections prepared from "normal" human material obtained at necropsy. They are thus comparable with photomicrographs of human pathological material derived from the same source. The explanatory captions for the illustrations have been planned with great care and form a reliable indication of the essential points which should be noted in each section. Among the many excellent photomicrographs special mention may be made of Fig. 225, a gold chloride preparation of a muscle spindle; and Fig. 228, which shows the nerve plexus in the substantia propria of the cornea and free nerve endings in the conjunctiva. A series of transverse sections through the brain stem prepared by the Weigert-Pal method is also worthy of mention, and forms a valuable contribution towards the detailed study of this region.

The book is well written and well illustrated, and if read in conjunction with standard works on general histology in which photomicrographs are supplemented by accurate high-power illustrations, showing cytological details which can only be recognized in material which has been fixed absolutely fresh and for this reason is usually not human, it will help to bridge many gaps which are apparent between these and the actual specimens with which a student is frequently confronted.

ADLER: THE COMPASSIONATE CYNIC

Alfred Adler, Apostle of Freedom. By Phyllis Bottome. (Pp. 386. 10s. 6d. net.) London: Faber and Faber. 1939.

Miss Phyllis Bottome knew Alfred Adler very well, and she sets forth his portrait with the pen of an experienced writer. All who knew him will recognize the penetrating accuracy of her description of him as a compassionate cynic. Frau Orgler's biography had enabled us to realize that Adler's philosophy was rooted in the successful overcoming of his own difficulties; here is an even fuller story. He always maintained that the earliest childish memory was significant, and his own was that of having to sit still, bandaged up on account of rickets; hence his earliest scientific views were based on organ inferiority. He attached great importance to the position of a child in the family sequence, the eldest son tending to be domineering and dictatorial, while the second son was often a congenital rebel. Freud was an eldest son, Adler a second, and they lived up to those roles in their personal relationships. Adler regarded marriage as designed for mutual consolation and the enrichment of life, and it was not easy to learn that lesson mated to a fiery Russian who was not enamoured of the Teutonic conception of a *Hausfrau*; yet he ultimately succeeded. All this is painted against the charming background of pre-war Vienna—baroque architecture, the Wienerwald, music, and the café life—that parliament of the people. As she says, it is not surprising that a type of psychology based upon social interest should have sprung from a city that was the most cultured, tolerant, witty, and internationally minded capital in Europe up to the time of the German occupation.

It is therefore a pity that so much space should have been given to details of dead and gone quarrels and intrigues. Particularly so since "for political reasons" many participants can only be described by a capital letter. Such anonymous disputes cannot interest even a scandalmonger. On page 311 we find the serious misstatement that "Cambridge University refused point blank to invite Adler to speak for it," whereas the Faculty Board of Medicine invited him to give two lectures (for which they paid him a fee) and announced them in the *University Reporter*. The Regius Professor of Physic took the chair and the Professor of Psychology proposed the vote of thanks: the largest lecture theatre in the Medical School was filled to overflowing. In describing this as a point-blank refusal we feel that the novelist has gained the upper hand of the biographer! It naturally makes us wonder whether some of the other "persecutions" have not been somewhat dramatized. It is of course true that many psychotherapists do not practise what they preach, finding the path they point out too arduous for the Old Adam, and it is also true that Adler was much freer from this fault than others. But it is

unedifying to rake up so much that might well be buried in the graves of two great men who each in his own way taught us the meaning of the Greek maxim "Know thyself."

For Adler's contribution was a great one, and if men ever get tired of banging their heads against the stone wall of the moral law they will find he has pointed to a more excellent way. From organ inferiority and its compensatory mechanisms he moved on to a conception of the style of life and the goal to which the individual was striving, he realized that psychoneurosis was a non-cooperative evasion of the demands of life, and reached the conclusion that the egocentric goal must be replaced by one of social interest to which every child must be trained until it becomes as natural to him as breathing or the upright gait—"the goal of the community, eternally ideal and unattainable, yet for ever calling to us." Not an easy creed to follow, and, as the author shrewdly points out, "the change in the human being required by anyone who accepted Freud's theory was less exacting than the change required in character by the theories of Adler." Practical steps towards that change were initiated by Adler in the child guidance clinics he founded, and in his scientific study of delinquency. To the end he remained hopeful, though aware that the world was moving in the wrong direction. He believed that dictators dig their own graves and carry the seeds of death about with them. "I can be king of the world," he explained, "only in a strait-jacket."

All this is set out clearly in a book which is valuable in many ways, but would have been greatly improved if the author had borne in mind that Adler tolerated everything except intolerance and, as she herself tells us, once murmured to an over-emphatic friend, "It is always easier to fight for one's principles than to live up to them." One trivial complaint in conclusion: we are surprised that so accomplished a writer should repeatedly adopt the modern vulgarism of using the word "alibi" as synonymous with any kind of defence or excuse.

Notes on Books

Ghosh's *Pharmacology, Materia Medica and Therapeutics* (Calcutta, Hilton and Co.) has now attained its fifteenth edition, and the last five editions have been prepared by the present author, Dr. B. N. GHOSH. The present edition incorporates the changes introduced by the *B.P. Addendum* of 1936. The author also provides information about many important recent advances in pharmacology; in particular an account is given of the actions of the sulphonamide drugs. A special feature of the volume is the clear account given of the remedies for important tropical diseases, such as malaria, hookworm, leishmaniasis, etc. It is published in London by H. K. Lewis and Co. at 15s.

Dr. E. P. FORTIN'S *Investigations sur le Glaucome* is essentially devoted to speculations based on the histology of the iris, ciliary body, and choroid. Whilst not ignoring the function of Schlemm's canal, he holds that the choroidal spaces are of the utmost significance for intraocular drainage. Scotomata in the field of vision he regards as the result of choroiditis damaging the overlying retina, the choroidal lesion not being visible owing to obscuration by the pigment layer. Similar suggestive but unverified propositions abound, but the value of the monograph lies in its somewhat novel histological studies—put forward not too convincingly. It is published at Buenos Aires by "El Ateneo."

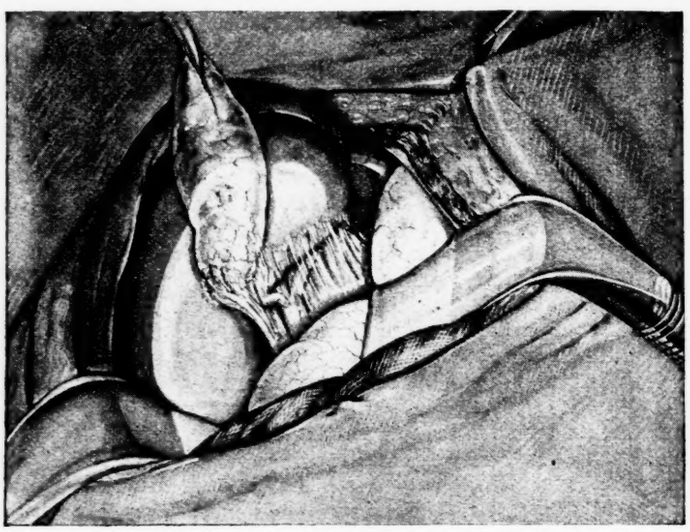
Preparations and Appliances

CURVLITE INSTRUMENTS IN ABDOMINAL SURGERY

Mr. CECIL P. G. WAKELEY, F.R.C.S., F.A.C.S., F.R.A.C.S., Temporary Surgeon Rear-Admiral, R.N., writes:

For nearly a year now I have been using curvlite retractors in abdominal surgery, and am so pleased with their usefulness that I consider that their great value should be more widely known.

Curvlite is a trade name for a boilable cold-light instrument which is unbreakable. For use as an abdominal retractor such an instrument combines a valuable light together with retraction.



Two curvlite retractors in use during the operation of cholecystectomy.

The retractors for abdominal work have been made for me by Vann Brothers of 63, Weymouth Street, London, W.1.

The instruments are made of a methyl methacrylate plastic which possesses the extraordinary quality of being able to transmit clear cold-light round curves. The rays of light travelling up the interior of the instrument strike the highly polished surface. Being unable to penetrate the exterior wall they travel down the inner shaft until they reach the end, where the specially ground surface diffuses the light and allows it to escape and illuminate the area of operation. It solves the problem of introducing cold-light inside the body, without danger, glare, or electric shock, and is especially useful in illuminating cavities and deep-lying structures.

In operating on a gall-bladder in a very fat patient the great difficulty the surgeon is faced with is adequate light and exposure. Two large abdominal curvlite retractors give all that is required (see illustration).

The whole of the curvlite instrument and connexion can be sterilized by boiling. The light can be obtained from a battery or by means of a transformer from the main electric supply. I consider that the curvlite retractors are a real major advance in the field of surgical lighting.

INTRAVENOUS PYELOGRAPHY

The pyelectan brand of iodoxyl injection (Glaxo Laboratories Ltd.) is the sodium salt of 3:5-di-iodo-4-pyridoxyl-N-methyl-2:6-dicarboxylic acid. This chemical compound has been proved to be of great value as a contrast agent in pyelography, and it is of interest to note that a new brand is now available.

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THE M.R.C. IN WAR AND PEACE

It is not easy to realize that at the beginning of the last war the Medical Research Council, or Medical Research Committee as it was then called, had only just come into being. Its influence on medical thought and the part it has played in the development of modern medicine have been such as to make it difficult to imagine a state of affairs in which medicine was without the Council's guidance. The annual report[1] just published is eloquent testimony to the wisdom and far-reaching value of this guidance. As was inevitable, the early work of the M.R.C. was directed to the solution of medical and surgical problems immediately affecting the health and welfare of the armed forces in the theatres of war and, later, of the munition workers on the home front. As the report for 1917–18 stated, "The needs of war have given stimulus to inquiries upon many sides, and out of the circumstances of the time some unusual opportunities and facilities have come to scientific workers." The last war, in fact, was a challenge to organized medical research as represented by the newly formed committee, and if there had been any doubts in the minds of those responsible for its formation these were soon put at rest by the volume of valuable work done by the committee under the inspiring lead of its first secretary, Sir Walter Fletcher. For example, special committees were established to study such matters as surgical shock, the medical aspect of chemical warfare, anaerobic bacteria and infections, air medical investigations, and amoebic and bacillary dysentery. These were presided over by men of the highest distinction in the particular subjects studied. Other important contributions to medical knowledge during the last war were the treatment of infected wounds by saline and by such new antiseptics as eusol, Dakin's solution, and acriflavine. Valuable knowledge was gained of the preventive efficacy of typhoid and paratyphoid vaccines; research was carried on into trench nephritis; and gunshot wounds of the chest stimulated surgical approach in a field that has steadily widened ever since. On the home front research was carried on into such matters as the poisoning of workers by trinitrotoluene and the effect of overtime on output. In addition to its manifold activities the Medical Research Committee undertook the big task of compiling and analysing medical records for the Army Council, its statistical department being then temporarily housed in the British Museum. The records thus obtained provided data for the statistical analysis of injuries or diseases and for the adjudication of future pension claims. Towards the end of the war the statistical department of the committee was receiving inquiries from the Ministry of Pensions at the rate of 1,500 a month. Although research was directed chiefly to war problems other matters were not neglected, and among these the report refers to the nutritional questions which before the end of 1918 had become matters of national importance. At the present juncture it is the policy of the Council to encourage its research staff and grantees to investigate problems not immediately related to the war, although it recognizes that many research workers will be anxious to turn to those that are.

In war time the medical man may gain some consolation from the thought that his activities at least are reparative and constructive, and that even out of the filth and carnage of the battlefield come fresh accessions of medical knowledge of use not only at the time of their discovery but also in the alternating periods of peace and crisis that follow after. "The history of war is, in one sense," the introduction to the report states, "largely a race between the development of instruments of physical destruction and the advancement of medical knowledge for saving the life of wounded and sick men." Indeed, disease and infection have proved more powerful levellers than weight of metal and preponderance of fire. For example, out of the half-million men Napoleon raised in 1813, 219,000 had been lost through disease by the time he came to fight the Allies at Leipzig. During the Crimean War the French lost 49,815 by disease as against 20,356 by wounds, the corresponding figures for the British being 17,222 and 4,947. The losses sustained by the British through enteric fever in South Africa are well known. The control and treatment of infections have since 1918 progressed even perhaps more quickly than the destructive powers of the modern army. Enteric fever, of course, already came under control in the last war, and now there is the hope that the introduction of tetanus toxoid will prevent another deadly infection of the field. The new chemotherapeutic discoveries should prove to be of outstanding benefit. Wound infection was probably the largest single cause of death among men reaching hospital in the last war, and it is legitimate to expect that where such infection is due to haemolytic streptococci the experience of peace time will be repeated. The field of battle should prove a good testing ground for the value of sulphonamide compounds, especially in their prophylactic effects. Arrangements have already been made with the Army Medical Services to determine whether administration of these compounds immediately after injury will prevent subsequent infection by the commoner pathogenic micro-organisms. Much, too, can be hoped for from sulphapyridine in the treatment of pneumococcal infections, cerebrospinal meningitis, and gonorrhoea. It is claimed that with the new treatment 90 per cent. of cases of gonorrhoea can now be cured within a week, whereas the time previously needed was often five months or more. As the report

[1] Cmd. 6163. H.M. Stationery Office. 1940. (3s.)

states, "In the dance of death, war will receive less help from death-bringing micro-organisms."

During the past two years the Medical Research Council has been busy in the preparation of various emergency medical services for the Government. It has, for example, undertaken to see that there was a sufficient supply of certain antitoxins for war purposes, in particular those for tetanus and gas gangrene. The Council was represented on the official committee dealing with the subject of other medical supplies in time of war, and its officers have been active in arranging for the production in this country of important drugs hitherto obtainable only from abroad. It has been responsible for the registration of all pathologists and medical bacteriologists, and has organized an emergency laboratory service to augment existing facilities, as it was thought desirable to provide against the increased danger of epidemic disease resulting from abnormal movements of population. This emergency service consists of three central and sixteen subsidiary laboratories in different parts of England and Wales, and is directly controlled by the M.R.C. In addition to this it has organized four blood transfusion depots in the Home Counties, primarily for civilian needs, although blood from these depots has already been supplied to the Army. Other matters dealt with are the vitamin content of tinned foodstuffs in Service rations and the health of munition and industrial workers; this latter is carried out by the Industrial Health Research Board, which forms part of the Council's organization.

While much of the introduction to this year's annual report is devoted to medical problems of war, those of peace are by no means neglected. Attention is drawn to the Committee on Preventive Medicine, which was set up last year and is now working under the chairmanship of Sir Wilson Jameson. The appointment of this committee was an expression of the Council's concern with the slow way in which new methods of preventing disease were adopted. Confronted with a formidable task, the committee has directed its attention to a few special subjects such as methods of immunization against diphtheria and whooping-cough, the problem of cross-infection in hospital wards, field studies in nutrition, and investigations into the high mortality rates of bronchopneumonia, of enteritis in children, and of respiratory diseases during winter. The report points out that Griffith and Lancefield, by devising a technique for recognizing a multiplicity of different types of haemolytic streptococci, have provided a method of attacking the problem of cross-infection. Puerperal sepsis was successfully tackled along these lines, Smith and Colebrook showing that in most cases the patient was infected either from her own throat or from some person in attendance on her. Okell and Elliott found a particular type of haemolytic streptococcus responsible for the passage of infection from one case to another in fourteen outbreaks in surgical wards. Such cross-infections are common, and often tragic, in fever hospitals. Inquiries started for the new committee have unfortunately been interrupted by the war, but preliminary observations by Dr. Joyce Wright in one of the L.C.C. fever hospitals suggest that the usual form of bed isolation is not effective in preventing cross-infection in scarlet fever wards. Here perhaps is a problem begun in peace which might well be continued in war. Another problem much in need of solution is that of enteritis among infants, in whom it remains the greatest cause of death. For example, in 1937 there were in this country 4,925 deaths from diarrhoea and enteritis, mostly in children under 2 years of age: every effort is to be made to investigate such outbreaks as fully as the circumstances of war permit. After dealing with questions of immunity and referring to the possibility of producing synthetic antigens, the report gives a most interesting account of experiments made by Dr. A. S. Parkes and Dr. J. Hammond to increase the fertility of sheep by the injection of gonadotrophic hormones. The fact that it may be possible to obtain three sets of offspring in the course of two years, instead of two, and to increase the number of lambs born at each pregnancy, makes clear the importance of this work. A section under the heading of "Chemistry of Brain Reaction" is yet another signpost showing the way of modern medical research, and a fascinating account links up the oxidation of glucose, essential to the normal function of the nervous system, with vitamin B_1 and acetylcholine. Lastly, the introduction deals with the recently issued report on breathing machines, which we discuss below.

BREATHING MACHINES

The epidemic of poliomyelitis in 1938, though small in comparison with those which have occurred in other countries, was nevertheless attended by a sufficient number of cases of respiratory paralysis to arouse public interest in the problem. This interest had two notable effects. The first was a request from the Ministry of Health to the Medical Research Council for advice on the choice and distribution of apparatus for artificial respiration, as a result of which the Respirators (Poliomyelitis) Committee was appointed, with Professor L. J. Witts as chairman. The second was Lord Nuffield's generous offer to manufacture a large number of machines free of charge for use throughout the Empire. In ordinary times the publication of the committee's report[1] would doubtless have aroused echoes of the controversy which followed Lord Nuffield's gift, although it has been the aim of the committee to divest the subject of some of the emotion which has surrounded it. Two main conclusions emerge from the report. The first is that apparatus for artificial respiration is still in a state of active evolution, the early, relatively complex types apparently giving place to simpler forms. The second is that the organization and administration of treatment are more important than the particular pattern of machine.

The committee begins by recommending the name "breathing machines" on the grounds that "respirator" now connotes a gas mask, "artificial respiration

[1] *"Breathing Machines" and their Use in Treatment.* Report of the Respirators (Poliomyelitis) Committee (1939). Med. Res. Cncl. Sp. Rep. Ser., No. 237.

apparatus" is the term used for apparatus supplying oxygen or oxygen and carbon dioxide for revival from asphyxia, while "iron lung" is an inappropriate name for apparatus made of rubber, wood, and aluminium. Paradoxically the report first describes the history and methods of manual artificial respiration in order to emphasize that the great majority of respiratory emergencies are quite unsuitable for treatment in a machine and that no development or multiplication of apparatus can compare in usefulness with the training of all members of the community in manual methods of artificial respiration. It then enumerates and describes the most important types of machine, and many readers will be surprised at the number and rapidity of new developments in the last few years. The most important subdivision is into apparatus suitable for emergencies of relatively short duration—such as Eve's tilting stretcher and bed, and masks utilizing the pressure of an oxygen cylinder to inflate the thorax—and machines in which the patient may remain for weeks or months. The committee reviews the published experience of the use of machines—mainly American—and the clinical experience in this country. It describes the incidence of respiratory paralysis, and points out that in this country the provision for treatment was quite inadequate in 1938. It then discusses the indications for the use of breathing machines and the management and nursing technique. Finally it advises on the choice and location of apparatus and the future organization of treatment and research. The committee points out that while there are numerous types of breathing machine there are not enough data to assess their relative efficiency. Even so well-known a machine as the Bragg-Paul has not been used in anterior poliomyelitis in a large enough number of cases or under suitable conditions to allow a scientific comparison with the Drinker. The tendency of recent designs, however, seems to be away from the cabinet type of machine and towards negative-pressure cuirasses, which may be combined with elaborate arrangements for splinting the limbs. There are greater difficulties in fitting these machines to the patient than with complete enclosure of the body, and several sizes must be provided; but nursing is much easier and the machines are simple to transport or to store. The most important question now to be decided is whether these negative-pressure cuirasses are more efficient respirators than the Bragg-Paul pulsator, which works by exercising positive pressure on the chest wall.

Patients who really need treatment in a breathing machine are exceedingly ill, and their treatment demands the highest skill. Of a large series of patients with poliomyelitis treated in America nearly 60 per cent. died in the machine, and of those who survived treatment between one-third and one-half died in the subsequent eighteen months. Cases of spinal paralysis do relatively well, but cases of bulbar paralysis do very badly, and there is in fact evidence to suggest that better results may be obtained in them from measures directed to maintaining the patency of the air passages than from indiscriminate use of the machine. Not only in poliomyelitis but also in diphtheria and poisoning failure of respiration is only one element in a serious illness, and the other symptoms demand equally specialized skill. The committee points out that the physician in private practice or on the staff of a general hospital may go for very long periods without ever seeing a case of respiratory paralysis which could be appropriately treated in a machine, and the figures it has collected suggest that people who treat only a few cases do not get such good results as those who have more experience. With the aid of manual artificial respiration or the simpler types of apparatus it is now possible to transport patients long distances by car, train, or aeroplane. The London County Council has evolved a policy under which breathing machines are kept at a limited number of hospitals, and, should a machine be required for the treatment of any form of respiratory paralysis, it is stressed that so far as practicable the patient must be brought to the machine and not the machine to the patient. Abroad an even greater degree of centralization has been practised. "In the 1937 epidemic of poliomyelitis in Australia, 250 beds at the Fairfield Hospital, Melbourne, were reserved for poliomyelitis, and over a thousand patients passed through these beds. Up to twenty-three breathing machines were in use at one time. The appearance of a sixteen-bed ward with machines eight a side instead of beds, with air hoses, pulsators, controls, pilot lamps, and switch gear, was described as most impressive. It was considered necessary to have three day and two night nurses for each five respirators, in addition to the sister in charge. An independent electric supply was provided in case of current failure, oxygen cylinders for changing, and continuous suction for drainage of the airway. It was considered that the special experience of the nurses made possible a quite notable saving of life."

The committee concludes that the recent wide distribution of the Both type of breathing machine has eased the situation, but can only be regarded as a temporary solution. It strongly recommends that the treatment of protracted respiratory paralysis should be concentrated in the minimum possible number of hospitals. Diphtheria is a diminishing problem which should be abolished by immunization, and therefore the chief illnesses to be considered are poliomyelitis and poisoning. Poliomyelitis is best treated in special units, attached either to a hospital for infectious diseases or to an orthopaedic hospital, and one unit of this kind might well suffice for each regional hospital area. The treatment of poisoning is notoriously unsatisfactory, and (as the committee points out) only too often it is left to inexperienced personnel. Respirator units specially equipped for the treatment of poisoning are therefore recommended at one or more large hospitals in each area, and to these would also be sent all cases of respiratory failure which are of longer duration than can conveniently be dealt with by manual respiration or the simpler types of apparatus. There is also a place for a hire service of machines for patients who wish to be treated in their own homes or in nursing homes. The committee's main work was done before the war, but its recommendations will fit in well with the type of organization which war time has forced upon us. The report is a most valuable compilation.

PREVENTION OF DIPHTHERIA

The danger of basing conclusions on the falling incidence of an infectious disease which follows the application of some new therapeutic or preventive measure is, or should be, well recognized. Dr. H. P. G. Seckel of Chicago[1] once more draws attention to this danger in assessing the efficiency of active immunization against diphtheria, illustrating his remarks with graphs of the normal swing from trough to peak in the incidence of this disease in different countries. Clearly no *post hoc propter hoc* can be justified unless this normal time-trend over both long and short periods is taken into consideration. If the case for active intervention is to be based on figures of falling incidence then one of the two following conditions must be observed. After wide-scale immunization the incidence must drop sharply to very low limits with a momentum and to a level never previously observed in the area under survey. Such an effect has, for example, been reported by Fitzgerald and his colleagues from Canadian cities.[2] Alternatively, observation must be maintained over a considerable number of years, and the disease must be shown to remain at a low level without its customary upward wave. Seckel quotes the experience of New York City, where large-scale immunization of pre-school children was started in 1929. The previous peak in diphtheria incidence was in 1927, and the next peak was expected about 1934. This, however, did not occur, the six- to seven-year cycle, which had been apparent since 1895, being thereby broken. Even here the time-scale is relatively short. As in the island of Guernsey, where a laudable attempt is being made to eradicate epidemic diphtheria by a compulsory inoculation order, at least ten years must elapse before conclusions of real scientific value can be warranted, although the actual advantage to the community may, of course, be reaped at once. The alternative to this statistical method of assessing the efficiency of diphtheria immunization is a comparison of the experiences of immunized and non-immunized children, for which, as Seckel points out, data relating to children of the same age in the same place and at the same time are necessary. Though it is difficult to secure such groups, many reports have been published which substantiate the claims made for immunization. It is, however, more difficult to place a precise figure on the degree of advantage enjoyed by the immunized. Seckel puts their diphtheria morbidity at one-third to one-eighth, or an even smaller fraction, of that of non-immunized children. The author compares 897 cases taken from the literature of diphtheria in immunized children with 1,191 of his own cases in non-immunized children in Cologne. In both groups 15 to 16 per cent. of the attacks were of the toxic type, but in the immunized children there was a reduction of dangerous laryngeal diphtheria with a corresponding increase in the harmless localized pharyngeal variety. In addition, in the severe cases, both diphtheritic croup and toxic diphtheria, the fatality rate of the immunized was lower. These comparisons are not, as Seckel recognizes, free from sources of error, and he suggests that it would be of value to conduct a large-scale investigation into diphtheria in immunized and non-immunized children from the point of view of the type rather than of the severity of the attack. For the treatment of cases of toxic or malignant diphtheria Seckel quotes statistics in favour of parenteral protein therapy or intravenous dextrose injections. He concludes that the latter should be used in combination with some form of protein therapy in all severely toxic cases.

[1] *Amer. J. Dis. Child.*, 1939, **58**, 512.
[2] *Lancet*, 1938, **1**, 391.

THE MACEWEN OUTLOOK IN SURGERY

Professor G. Grey Turner has now published the Macewen Memorial Lecture which he delivered last year at the University of Glasgow, entitled "The Macewen Outlook in Surgery." The lecture is so well phrased and so well illustrated that it will be read with pleasure and with profit by the wide circle who recognize how much Macewen did to advance those branches of surgery which he made his own. Professor Grey Turner begins with some personal reminiscences of the great surgeon, and recalls that he was most struck by the magnificent bearing, the assurance, and the sense of self-sufficiency of one who, succeeding to the chair once held by Lister, adopted his principles but struck out a path for himself as regards the details. Such impressions are of great value, for the personality of even the greatest men is soon lost to succeeding generations. From these recollections Professor Grey Turner proceeds to consider the pioneer work done by Macewen in connexion with pyogenic infective disease of the brain and spinal cord; knock-knee; the radical operation for the cure of hernia; the operative treatment of disease of the lung; and the scientific study of the growth and survival of human bone. The lecture concludes with a survey of the work stimulated by the Macewen methods and outlook, the surgery of cancer of the oesophagus being taken as an example. The peroration contains a noble tribute to Macewen, declaring that "the lessons of his surgical life are not yet fully appreciated. Like evening shadows, they are lengthened and strengthened by distance, and there can be no doubt that in the cool judgment of posterity, when his memory is stripped of all but essentials, his name will stand out as one of the brightest stars in the surgical firmament."

THE HEALTH SANDWICH

In a recent leading article headed "Food and Nutrition of Children"[1] we gave an account of an experiment in London with what was termed a "health dinner," which was in turn derived substantially from the "Oslo breakfast." The pioneer in this field in this country appears to have been Dr. E. H. M. Milligan, medical officer of health for Glossop, who has for some years been making use of supplementary nourishment in addition to milk for under-nourished school children. Dr. Milligan's "health sandwich" consists of wholemeal bread 2 oz., butter 1/2 oz., brewer's yeast 1/8 oz. as a base, with, in rotation, cheese 3/4 oz. for three days a week and meat or eggs 3/4 oz. on other days, with salad in season—for example, mustard and cress, lettuce, or tomato 1/2 oz. A sandwich on these lines, together with the two-thirds of a pint of milk allowed, yields between 17 and 18 grammes of animal protein, about 30 grammes of fat, and an average of 550 calories—all entirely additional to the home diet. In Cambridgeshire Dr. French is also using a sandwich supplement for under-nourished children with the school milk. Wholemeal bread and butter is the basis; on two days a week the "middle" is grated cheese with a thin spread of marmite; on two other days minced liver and marmite are used, and on the fifth day either beef or herring, with salad in season such as lettuce or grated carrot. In Cumberland supplements to the milk ration have taken the form of a buttered wholemeal sultana tea-cake and cheese with the morning half-pint of milk, and in the afternoon, with the remaining half-pint of milk, two wholemeal biscuits. Oranges are also served at the close of afternoon school. Experi-

[1] *British Medical Journal*, 1940, **1**, 178.

ments with other supplementary meals are in progress in Ipswich, Pontypridd, and the Isle of Ely. The English school medical service has therefore no need to shelter its progressive nutritional endeavours behind a Norwegian nomenclature. Dr. Milligan's health sandwich has evolved contemporaneously with the Oslo breakfast, and is obviously more suited to English dietetic habits. The facts about these supplements to the milk-in-schools scheme are contained in the annual report[2] of the Chief Medical Officer to the Board of Education for the year 1938, and a word of warning is appended to this section—namely, "Most of these supplementary meals, especially the preparation of salads or sandwiches, involve a great deal of handling of food, which is subsequently served uncooked. It is therefore necessary that those who prepare the food should themselves be scrupulously clean, should be provided with ample washing facilities, and should be carefully supervised as to their own health."

MOTOR DRIVERS' PRONENESS TO ACCIDENT

In Report No. 84 of the Industrial Health Research Board (H.M. Stationery Office; 9d. net) E. Farmer and E. G. Chambers describe detailed observations on proneness to accident in motor drivers. Altogether seven groups of drivers were investigated. The most reliable group consisted of 166 bus drivers, all of whom knew how to drive cars before they were accepted by the London Transport Board. They were given an intensive course of training and had to pass a severe driving test before being allowed on the London streets. In spite of these precautions they showed remarkable and fairly consistent differences in their liability to suffer accidents. Over a period of five years a few of the drivers had 0 to 2 accidents altogether, while in contrast one driver had no fewer than 6, 6, 9, 4, and 7 accidents in successive years, and a number of others had 17 to 21 accidents in the five years. These accident-prone men did not appear to specialize in the type of accident incurred, but exhibited skids, over-runs, errors of judgment, and other types of accident more or less impartially. It is evident that if they had been detected early in their career and transferred to some less risky occupation the accident frequency of the whole group of busmen would have been substantially reduced. In order to evolve a suitable means of detection the men were subjected by the investigators to a careful psychological examination, involving their ability to perform various aesthetokinetic tests, linguistic intelligence tests, and a perseveration test. The simple "trial and error" test was also found to be most useful, the forty-six drivers who sustained more than three accidents in their first year being regarded as specially prone. The average results showed that if these prone drivers had been removed the subsequent accident rate of the busmen would have been reduced by 9 per cent.; but if, in addition, regard was paid to the findings of the psychological tests, and seventy-three drivers were removed, the accident rate was reduced 13 per cent. A still more stringent selection would have reduced the accident rate still further, but it is obviously an exceedingly difficult problem to effect a great improvement in a group of men who have already been highly selected before admission as London bus drivers. Another group of men, 398 in number, were investigated for a two-year period, and the majority of those who did badly in the tests were not accepted for employment. Two other smaller groups were investigated for a four-year period, while large groups of private car drivers were investigated in less detail. It appeared that accident liability diminished gradually with increasing age, drivers of 55 and upwards suffering only two-thirds as many accidents as those aged 20 to 24. This was mostly the result of experience, for it was found that the group of bus drivers previously mentioned sustained about 60 per cent. more accidents in their first year than they did subsequently, the accidents due to skids, errors of judgment, and miscellaneous causes decreasing throughout the whole five years of observation.

[2] *The Health of the School Child.* H.M. Stationery Office, 1940, p. 27.

ATMOSPHERE AND HUMAN COMFORT

It is now generally agreed that the chief cause of discomfort in crowded assemblies is excessive warmth and stagnation of the air. The actual temperature is easily ascertained, but the degree of stagnation, which depends on the variability of the air currents, requires a special method for its measurement. In a recent number of the *Journal of the Institution of Heating and Ventilating Engineers* (November, 1939) Dr. T. Bedford briefly describes the method used and the results obtained. It appeared that in the observations—made both in winter and in summer—increased air movement and reduced temperature were both associated with an impression of greater freshness, but the invigorating effect of air movement was more noticeable at high temperatures than at low ones. Observations made with the dry katathermometer showed that it is a very good indicator of the freshness of the air owing to its excessive sensitivity to air movement, but for this very reason it is not a good measure of warmth as it was formerly thought to be. It is by no means easy to attain the best atmospheric conditions in buildings, especially those with mechanical ventilation. The air inlets used in these systems should be so arranged that suitable eddying currents are set up, and the air heating should be supplemented by some form of radiant heating. Radiant heating by means of ceiling panels tends to reduce the air movement, and special attention should be paid to the ventilation arrangements.

MEDICAL SERVICE WITH THE FORCES

The following resolution was carried without dissent at the meeting of the Central Medical War Committee held on Wednesday, February 21, and has been forwarded to the two Government Departments concerned:

> "That it be represented to the Minister of Health and the Minister of Labour and National Service that medical practitioners who are within the age limits of current Proclamations should now be made liable for compulsory medical service with the armed Forces—this compulsion to be applied through the machinery of the Central Medical War Committee."

The Bradshaw Lecture (postponed from 1939) will be delivered before the Royal College of Physicians of London by Dr. J. C. Spence on Thursday, March 7; its title is "On the Nature of Disease in Infancy." Professor E. P. Cathcart's Oliver-Sharpey Lectures on "The Mystery of Alimentation" will be given on March 12 and 14. All three lectures will be given at 2.30 p.m. at the College, Pall Mall East, S.W.

MEDICAL PROBLEMS IN WAR

This is the last of three articles surveying the literature of neuroses in war

NEUROSES IN WAR

BY

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Prophylaxis

Comparatively late in the last war it was realized that the elimination from the Army of those "whose make-up was such that their behaviour would be inconsistent with military service"—that is, men with manifest psychoses and neuroses and those likely to break down—was in the interest both of the individual and of the country (P. Bailey, MacCurdy, Culpin). "I feel confident that careful weeding out of the mentally unstable will certainly greatly reduce the numbers of shell-shock cases that are bound to appear in our casualty lists" (Osler). After an expensive training many of them proved to be inefficient soldiers affecting the morale of their unit; they occupied beds needed for acute surgical cases, required prolonged medical attention, and were often finally discharged on pension. Many of them, on the other hand, while unable to adjust to military discipline, might have proved of material service in their civilian occupation. General agreement was reached concerning the rejection of manifest psychoses, but difficulties arose in the sorting out of potential breakdowns. An elaborate system for the elimination of soldiers psychologically unfit for service existed in the American Forces. The original method of examining only soldiers referred by M.O.s and company commanders proved inadequate and was supplemented by a rapid neuropsychiatric examination of all men. On the basis of a brief conversation and of observation during physical examination the recruit was passed or, if unsatisfactory, was deferred for a thorough examination. An examiner could dispose of 100 to 150 cases a day with reasonable accuracy. His recommendations were considered by a disability board composed of general medical officers and psychiatrists. The main difficulties arose from medical officers, whereas the line officers, who rated their men in terms of conduct, behaviour, and efficiency, were extremely sympathetic and co-operative. About 10 per 1,000 men were found to be unfit for service on account of neuropsychiatric disorders. Mental deficiency was most common (31 per cent.), neuroses (17 per cent.), psychoses (11 per cent.), constitutional psychopathic states and epilepsy (each 9 per cent.), organic nervous disease (10 per cent.), endocrine disorders (7 per cent.), and inebriety (6 per cent.) making up the remainder.

Further prophylactic measures advocated (MacCurdy, Tyrrell) concerned the mental hygiene of the combatant soldier and included the granting of rest, distraction, and relief from duty as frequently as the military situation would permit. Troops were not to be left too long in one sector or in a lonely position (Goodwin). Short periods of rest in those displaying prodromal symptoms often prevented, or at least postponed, the outbreak of a neurosis, which when fully developed required prolonged treatment. The recovery rate of incipient neurotic states was given as 38 per cent. in the observations of Roussy, Brisseau, and D'Oelsnitz.

Instruction of M.O.s and talks of a suitable character to the line commanders and privates on the nature and symptoms of neuroses in war time proved to be valuable (Bailey and M. Prince).

Treatment

Treatment of neuroses in war time differs from civilian practice in so far as the aims and methods of treatment have to be adapted to the special circumstances. The necessity for the rapid restoration of man power imposes a time limit upon any therapeutic methods, so that the aims of treatment are bound to be limited to the quick removal of symptoms with little consideration for underlying difficulties. The methods of treatment employed in 1914–18 are reviewed by Crichton-Miller and others. These embraced the whole range of psychotherapy, and may be divided, according to the aim, into "covering" and "uncovering" methods, and, according to the procedure, into authoritarian and benevolent methods. The covering methods are directed towards a removal of symptoms; the uncovering methods attempt to approach the underlying causative factors. Preference was given to any of these methods according to the place of treatment, the time available, and the personality, training, and psychopathological outlook of the physician.

Place of Treatment

A graphic description of the conditions prevailing and of the emergency measures undertaken at a field hospital was given by Rhein. "The men arrived dirty, muddy, silent, trembling, tense, with drawn faces and relaxed postures, seeking resting-places at once on a bench which might be part of the scanty furniture. They seemed in the main depressed, awed, anxious, afraid they had acquired some incurable affection, that they were paralysed or were losing their minds. A careful analysis of the mental state of men under these conditions was of course out of the question. They were given a warm shower-bath, some food, and sent to bed, where they fell into a deep slumber which lasted a day or two. Then a division of cases took place." Cases of "hyperemotivity" or states of tremor cleared up after a few days of rest; others in a more severe and chronic state had to be sent to the rear. General agreement exists that the place of treatment should be as near the fighting line as practicable, since by this means treatment could be reduced in time from months or weeks to days or hours (Holmes, Hart, Roussy and L'Hermitte). The details of organization are discussed elsewhere.

Methods of Treatment

Most writers deprecate an oversympathetic attitude and stress the necessity for a hopeful yet military atmosphere in the wards and for complete co-operation between all members of the staff, nurses, and visitors. Where possible new cases should be received into wards containing

improved or cured cases (Nonne). The physical regime most commonly recommended consisted of rest and quiet, with hypnotics during the first few days.

For writers who looked on the cases as akin to malingering, treatment was a matter of punishment and included such measures as isolation, severe restriction of diet, transfer to "excited wards" (Lewandowsky), application of painful electrical currents, and prolonged baths until recovery (Weichbrodt). The chief exponent of the most rigorous form of electrotherapy was Kaufmann, whose treatment consisted of three phases: (1) suggestive preparation—the patient was told that painful electrical currents would be applied which were certain to cure his condition; (2) application of strong faradic currents for one or two hours; (3) active military exercises. The "cure" was usually completed in one sitting. This method, originally received with great enthusiasm because of the rapid recoveries, was later generally discarded when fatal cases occurred (Liebermeister, Gildemeister) and permanency of results was doubted (Binswanger).

Similar but less severe boredom and a restricted diet were advocated for the treatment of hysterical disorders by Kretschmer, who recommended the accommodation of patients in darkened rooms. The impression of inflicting punishment was to be avoided, and the patients were told that these measures were necessary "to calm their nerves." After a week or two motor phenomena like tic and tremor subsided and had often disappeared after about six weeks.

Other physicians preferred rest, good food, and firm benevolence, combined with reassuring and encouraging talks. After a simple explanation of the nature of the condition, readjustment was achieved by an appeal to patriotism and the sense of duty. In line with this an extensive use of occupational therapy was made (Mott, Adrian and Yealland, Parsons, Binswanger, Wollenberg).

Work according to personal capacities and interests rather than non-productive mechanical routine work such as mat-making, paid work rather than unpaid work, acted as a valuable incentive to recovery. The patients were employed in the policing of the hospital, in farm work and road-making, and in workshops. In the later stages of the war experimental use of these patients was made in munition factories in Germany. Various methods of suggestion were employed successfully, including the use of mild faradism, graduated exercises, and direct hypnotic suggestion. Remarkably rapid results were obtained by hypnotic suggestion in hysterical motor disorders, but the liability of the recovery was shown by Nonne, who could easily reproduce the symptoms under hypnosis after apparent restoration of function. Sham operations carried out under general anaesthesia, although successful in some cases, were generally rejected on theoretical grounds (Hurst, Rothmann, Goldstein).

Much later in the war a group of physicians arose who believed that the neuroses of war were invariably related to repressed emotion and that, for cure, this must be expressed in the form of abreaction, either in the waking state or under hypnosis. Some confined themselves to a revival and reproduction under hypnosis of the suppressed or repressed emotional incidents, for which there was a subsequent complete amnesia (Rivers, Brown, Hadfield, Brend, Sauer), whereas others (Eder, Culpin, Nicoll, Simmel), by a combination of analytical cathartic hypnosis with analytic discussion and dream interpretation, endeavoured to understand and relieve the underlying conflict situation. According to Simmel an average of two or three sittings brought about relief of symptoms, but since abreaction in speech alone was usually insufficient in this compressed form of treatment he provided an upholstered dummy to assist the acting out of the repressed emotion.

Some instances taken from the literature illustrate the various methods of treatment.

The routine treatment of hysterics in base hospitals of the American Expeditionary Force (Schwab and Fenton) started with a simple explanation of the hysterical mechanism of the symptoms. The patient was assured of its unconscious nature and of rapid disappearance of symptoms provided he gave his co-operation. Then followed the use of one of the many methods of suggestive symptomatic treatment. Finally, due emphasis was laid on the fact that the symptoms had disappeared and on the mechanism of their disappearance. For hysterical amnesias associative exercises leading back to the events concerned were advocated In contrast to cases of conversion hysteria, which rapidly responded to practically any form of treatment, great difficulties were met in the treatment of anxiety states. "A modified psycho-analytic procedure, adapted to a war-born condition, divorced from a good deal of the technical complications of the method used in peace time," was employed to relieve the patient from the ill effects of repression; he was encouraged to talk freely about his experiences, to go over the emotional states that accompanied them, and to examine himself as critically as he could. His chief current conflicts were analysed out in this way.

In cases of conversion hysteria a process of re-education on similar lines was practised by MacCurdy. In a simple explanatory talk the patient was reassured that his legs, for instance, were not really paralysed, but that he had forgotten how to use them and that he must learn to do so over again. Suggestion or hypnosis then served to demonstrate that the function which was lost or disturbed was not vitally affected. The recovery of function was attributed to the patient's efforts and not to those of the physician. Various tricks were used to demonstrate the presence of the capacity which seemed to have gone, such as a sudden sound, with jumping, in hysterical deafness, and the demonstration of response to electrical stimulation in paralysed limbs. Active movements were then gradually encouraged. In cases of incomplete dissociation patients are vaguely aware of the psychic origin of the symptoms and are apt to develop a fear of insanity. A friendly relationship with the physician allays their morbid fears and diminishes the difficulties over authority which are a source of neurotic manifestations. "Any physician who has a reasonable fund of common sense and a natural interest in his patients is bound to be successful in the treatment of many of these cases."

Based on the concept of a conflict between a desire to get away from the firing line and a sense of duty, MacCurdy recommends the removal of anxiety neurotics to a quiet environment, absolute rest for the first few days, and a Weir-Mitchell type of diet to combat the sense of fatigue. Isolation is harmful in patients subject to the fear of being left alone. The use of hypnotics and sedatives, unavoidable in the first few days, is deprecated later on, and may be substituted by hydrotherapy or suggestion. More active measures are practised once the patient gets over his initial stage of fatigue. For the treatment of his most obvious subjective difficulties—the fear of war and the thought of its horrors—distraction in one form or another proved helpful. In a common-sense conversation the patient was reassured that he was going to get well, and this recovery would be greatly facilitated by his active co-operation. An effort was made to produce a state of mind wherein he was willing for the time being to forget the war without fostering the idea that he was out of it for good. Occupational therapy, adapted to individual requirements, was invariably given. Temporary absence from the military atmosphere, granting of leave, and feminine companionship proved beneficial. In most patients the symptoms cleared up under symptomatic treatment of this nature. In some, conversations explaining the underlying conflict assisted in the final adjustment.

No fixed rules in the treatment of war neurotics were adopted by Culpin. "If the paraplegic or the mute can be made to walk or speak by half an hour spent in explanation and persuasion—to act on that principle is plainly a matter of common sense." More often than not anxiety states do not respond to rest and quiet. For them, for hysterical patients refractory to simple methods, and for obsessionals a modified psycho-analytical method was recommended.

Prognosis

As in peace time, the prognosis of neurosis in war time depends on the age and intelligence of the patient and on the duration, nature, and severity of the disorder. Actual breakdowns or pronounced character difficulties before enlistment, and a preponderance of endogenous over exogenous factors, were of bad prognostic significance. Under severe stress almost anyone may break down. The significance of a positive family history is debated. Cases beginning on home service, on leave, or during discharge were unfavourable. Early treatment and the place and nature of treatment are important factors. Premature discharge often led to a recurrence of symptoms. Not infrequently during the last war the announcement of imminent discharge from hospital produced a return of symptoms. If in spite of this the patient was discharged to his unit the symptoms were aggravated during the transport; when he finally rejoined his regiment he was often in such a state that immediate readmission to hospital was unavoidable. Thereafter he occupied hospital beds for weeks or months, and relapsed after discharge. It is generally held that the prognosis is favourable in regard to the removal of symptoms, doubtful in regard to complete recovery, and, once the patient has been removed to the base, almost hopeless so far as permanent fitness for front-line service is concerned.

Analysis of the figures available reveals that in spite of an apparent lack of uniformity the prognosis as regards return to duty bears a close relation to the place of treatment and the nature of the disorder. Concussion exhaustion, and "hyperemotivity" head the list of percentages of those returned to duty; conversion hysteria, gas neurosis, and "neurasthenia" follow, in that order; while anxiety states are even less favourable, and obsessional states and effort syndromes are at the bottom of the scale. Officer patients present less favourable material for return to duty: 25 per cent. returned, as compared with 51 per cent. of men (United States Army Report). The number of those returned to duty is in inverse proportion to the distance of the place of treatment from the firing line. This may be due in part to the sorting-out process whereby mild cases are successfully dealt with at advanced posts and never reach the base. Ninety-one per cent. of those treated at a French (Leri), 66 per cent. at a British (W. Brown), and 65 per cent. at an American casualty clearing station were returned to front-line duty after a few days' treatment. Accurate assessment of the incidence of relapses was made difficult by the movement of divisions, since the men did not return to the same centre. Tentative assessments vary between 4 per cent. (American) and 10 per cent. (Holmes). The average figure of those returned to duty from British "N.Y.D. neurological" centres situated in France was 75 per cent., while from corresponding American neurological hospitals it was 55 per cent. Conformity is lacking in regard to the results obtained in base hospitals in this country: 21 per cent. of cases discharged from Maghull Red Cross Special Military Hospital and 60 per cent. from the Canadian General Base Hospital at Ramsgate were returned to duty. The official statistics failed to indicate the number returned to front-line duty. According to Salmon, whose authoritative opinion was based on a wide survey, it was very low. Only 1.1 and 1.7 per cent. of cases treated in German base hospitals returned to front-line duty (Willmans, Stern). On this account it has been doubted if a return to front-line duty should invariably be the aim. It has been argued that the few "shell-shocked" soldiers returned to front-line duty, often inefficient and unreliable, hardly balance the large number of mental invalids in receipt of a pension. Early discharge, after rapid removal of their symptoms, to civilian occupation in which they can render greater services to the country has been suggested (MacCurdy, Gaupp).

Nearly 66,000 cases were accepted for pension by the Ministry of Pensions on account of functional disorders of the nervous system alone; 29,000 of these still drew pensions in 1938. Wounds and amputations apart, functional nervous disorders ran second in the incidence of disorders for which pensions were being paid. If functional diseases of the heart are included they rank first, even exceeding tuberculosis.

The most comprehensive survey of readjustment to civilian life was made in the psychiatric service of the American Army. A follow-up of 830 cases of typical war neuroses was undertaken in 1919–20 and 1924–5. The earlier survey showed that concussion and gas cases rank very high in the percentage of successful readaptation, while cases with a strong constitutional element such as hypochondriasis, psychasthenia, and timorousness did not readjust themselves nearly so well. It is pointed out that "many of the men who never saw action have a more serious aftermath in symptoms than those who were actually in the thick of it." In the 1919 survey a majority of hysterics were having difficulty in getting along in civil life and displayed numerous neurotic residues: little more than one-half of them were able to earn their living. A great number of anxiety and effort syndrome cases tended to be permanently affected. The clerical and professional groups made the best readjustment, those in agriculture the poorest. In 1924 practically all the diagnostic group showed a higher percentage of readaptation, but gas neurosis and effort syndrome remained unchanged.

[*This and the preceding two articles are printed in the* Journal *by permission of Messrs. Macmillan and will be included in a book shortly to be published by them under the title of "Neuroses in Wartime," in which full references to the literature will be given.*]

War-time nursery centres are to be established in reception areas to provide evacuated children under the age of 5 with social training and occupation during the day. A circular issued by the Board of Education and Ministry of Health states that for children under 2 a simple day nursery or crèche will be sufficient. Children between 2 and 5 years should meet at centres in groups of ten to twenty for sessions corresponding to those in ordinary infants' schools. Each centre should be within easy walking distance of the children's billets, and the children should return for their midday meal unless communal meals are provided. Single empty rooms would provide the necessary accommodation provided that each child had a minimum floor space of 15 sq. ft. The children should be under the charge of a warden, not necessarily a qualified teacher but someone specially selected for her suitability for the work, who, in many cases, would undertake this work as a form of national service without payment. A superintendent who should be a trained and experienced nursery school or infants' teacher must be appointed to supervise the work of the wardens. An appendix to the circular contains detailed advice on premises, equipment, and the conduct of the centres.

THE WORK OF MEDICAL BOARDS

BY

D. G. GREENFIELD, M.D., F.R.C.S.

A doctor who takes part for the first time in the work of a medical board finds himself, to his surprise, in rather unfamiliar country. For now he has not only to do his usual work but he has to assess how any particular man will respond to conditions to which he is not accustomed. We have all felt the difficulty, and to meet it have doubtless evolved a system of working which is still improving. This article is written in the hope that it may be of use to others serving on medical boards.

There has been a certain amount of criticism of boards—some helpful, some the reverse. There are those who think that no error ought to be possible in a properly constituted board, and that the recruit should leave the board with a grade card which has no bigger margin of error than has a mathematical calculation. This can never be achieved. The utmost that can be expected is the considered opinion of five doctors after a careful examination. However searching the examination some things may escape detection, and the individual recruit's response to Service conditions is a matter of conjecture. This applies particularly in nervous and mental states.

Sectional Method of Examination

It has been argued that a better result would be obtained if one doctor did the whole of the examination of each recruit instead of the sectional method being employed, by which each man is examined by four doctors and then interviewed and if necessary examined by the chairman. With this I disagree entirely. There is, in my opinion, safety in his being examined by several people. Take for instance the case of one whose heart may be affected. No. 2 doctor examines the lungs and records the pulse rate, among other duties. If he counts the pulse by the stethoscope when he is examining the lungs he can make a mark if he detects anything abnormal and pass the recruit to No. 3, whose province it is to examine the heart. No. 4 has the remarks of Nos. 1, 2, and 3 in front of him, re-examines for any defect found, and in his report suggests a grading to the chairman, who then grades the man finally, and if his opinion differs from the other examiners they consult with him.

My own criticism of the sectional method of examination is that one slow doctor holds up the whole team. It is the chairman's duty, however, to see that an even flow of men is passing through the bays. When a block occurs, as it often does between 1 and 2 bays—No. 2 has one of the heaviest tasks—I allow No. 2 to pass men on to No. 3 with a paper, "Lungs not examined," No. 3 then examining the lungs instead of No. 2 until the block is overcome. The obvious way of lightening the work of No. 2 is to have the weighing and measuring done by an orderly. My chief criticism, however, is that there is too much time spent by the chairman in filling up duplicate forms.

Division of Duties

Other modifications that we have found useful are to obtain a better history by getting No. 1 to inquire specifically for fits, admissions to hospital, and, if a man has been discharged from the Forces, the reason for discharge. We find that epileptics sometimes conceal the fact, and that old soldiers wishing to re-enlist conceal their past history, which becomes available when they have joined a unit. No. 1 also makes a note in pencil of pes cavus if present when he examines the plantar response, because minor degrees of this are apt to be missed by No. 3 when examination takes place chiefly with the recruit standing. No. 2 records the pulse by the use of the stethoscope and makes a mark on the skin, or a pencil note, before passing him on to No. 3. No. 3 is asked to fill in physical development as good, fair, or poor; also to put every case through an exercise-tolerance test if there is any kind of murmur which is apparently harmless, any rapidity of pulse, or any history of rheumatism. I do not consider it necessary to use the exercise-tolerance test in all cases. No. 4 is asked to suggest two gradings—one solely based on the work entailed in his own section and another when he has received the gradings suggested by the previous doctor.

The work of the chairman is best done, I believe, by interfering as little as possible with his examiners. He cannot possibly examine all cases in detail; should he attempt to do so he removes some sense of responsibility from the others. He should examine any alteration from the normal reported to him. He should, I think, examine particularly any cases with a history of rheumatic fever or pleurisy. He should take the blood pressure in cases of albuminuria if that has not already been done by No. 4. He decides upon the need for a specialist's opinion. I gather there is a great difference in various medical boards as to the frequency of this step. It has now been found necessary in few cases. A surgical opinion is rarely necessary. It is laid down that a consultation should not be arranged unless the man is likely to be an efficient soldier. This means that a consultation is not to take place merely to clear up a diagnosis. For instance, any abdominal tumour would almost certainly bar a man from service, and although a diagnosis could not be arrived at by the board a consultation is not permissible.

Ophthalmic examinations are necessary when the sight is deficient and no glasses are worn, so that the amount of correction by glasses may be known. Ear examinations are required when foul discharge or granulations are present in the ear. If the services of a pathologist are to be had the number of consultations with a physician is minimized. Before this was sanctioned we had to refer cases of glycosuria, anaemia, and albuminuria which presented no clinical signs—the pathologist's opinion being the necessary one.

We have come to the conclusion that all cases with doubtful signs in the lungs and with very poor chest development or with any history of pleurisy should be examined by the tuberculosis officer, besides those with a personal history or bad family history of tuberculosis. It is useful in these cases to defer examination for one month to give the tuberculosis officer a chance of a second examination. We have had the help of a psychological clinic in one or two cases in which the mental condition has been unfavourable.

Cases Difficult to Grade

I will now deal with some of the cases that are particularly difficult to grade.

Eye Cases.—The recent change in the regulations has clarified the position considerably. The difficulties arise chiefly with men who do not wear spectacles. It is obvious that a man with 6/60 in each eye must be referred to a specialist: it is possible that he can be fully corrected and graded IIa vision. With a man who has 6/24 - 6/36 (that is, one eye with a deficiency of 1 dioptre to make him Grade I) to adhere strictly to the regulations would require an examination, but it hardly seems necessary since he will almost certainly be graded as IIa vision. The really difficult candidates are those who have full vision in one eye and less than 6/60 in the other—"with loss or practical loss of one eye": the practical loss I interpret as loss of sight. If the board is satisfied as to the reason, he is fit to serve. We have been "satisfied" in cases of men who have had a useless eye from infancy and in cases where an eye has been removed shortly after an accident. We have not been satisfied where there is any sign of cataract in young men or where the eye has been removed at a considerable time after an accident, because we could not be assured that "the other eye is free from disease."

Albuminuria.—All cases of considerable albuminuria with a raised blood pressure should be rejected. A large number

of young men have slight albuminuria at the time of examination, and the experience of the Post Office is that these may be accepted if it is the only fault found. All cases of slight albuminuria have been dealt with thus. The examination is deferred for a month; the man's doctor is written to and asked to make repeated examinations and to give his opinion as to whether there is any pathological condition present. This almost invariably results in a diagnosis of orthostatic albuminuria. If, however, it is persistent a pathological examination is asked for, and if the renal efficiency is suspect or any casts or red cells are found he is turned down.

All cases of *glycosuria* have been sent for pathological examination. In cases giving a doubtful reaction for sugar we have employed the indigo test, which I believe decides whether any reduction is due to sugar or not.

Asthma presents much difficulty. Knowing how unsatisfactory is the asthmatic as a soldier, I welcome the finding of any signs of emphysema or other signs in the chest which will cause him to be graded III.

Chorea in infancy, if the heart is sound, I do not consider seriously; but if chorea has occurred after school age and the history is properly confirmed this is, I think, enough to grade a man as IV.

Heart Disease has, I think, presented less trouble than might be expected in grading. It is now commonly recognized that a slight systolic bruit is generally of no particular importance. I feel that all members of the board should form an opinion if there is any suggestion of mitral stenosis or aortic regurgitation. In all heart cases I should like to emphasize that the most important sign is the position of the apex beat, getting the man to bend well forward to help in its determination if necessary. There has been a slight disagreement at times over the presence of a mitral systolic bruit. Some have urged that a perfectly fit man with such a bruit is not unfit to put in Grade I. With this I agree. But when there is every reason to think that there is a mitral regurgitation due to endocarditis he cannot in my opinion be graded higher than III, however good the condition of his heart. An exercise-tolerance test must be made in all heart cases unless there is evidence of a defect that unfits a man for the Service. We have had men who are said to have heart disease but whose hearts are found to be normal. I have felt that a consultant's opinion might be safer in such cases, but the board ought to accept responsibility unless it is in doubt, and I have endorsed the history sheet, "All doctors consider the heart sound," and made a note for graduated exercise if exercise has been forbidden.

Physical Disability is, I think, well dealt with in the instructions. Losses of fingers are rarely a reason for low grading, nor are slight curvatures of the spine or slight rachitic deformation of the chest. There is a tendency to consider too seriously deformities after fracture in the arm when the functional result is quite good.

Deformities of the Feet make a different story. The strict interpretation of the instruction caused me before the war to put in Grade III men who played Rugby football and complained of no disability whatever. They had "hammer toes with corns and the nails touched the ground." Pes cavus in slight degree is so common that it seems a "normal abnormality": in slight degree it causes practically no disability and no notice need be taken of it. Only when the toes are seriously contracted and the extensor tendons tense and bursae are present on the metatarsals should the grading be lower than IIa feet. The man with pes cavus has a strong foot, but a man with flat-foot has a weak one. Any man whose arch does not reappear readily on tiptoe should be graded IIa feet.

Adiposity should be viewed with considerable care in a young man. If he is fully developed sexually he may be quite fit, but the man with poor sexual development, slight knock-knees, and legs of the female type I would unhesitatingly put in Grade III. He is, I think, incapable of much exertion, is probably deficient in courage and grit, and is likely to become a jest for others and a misery to himself.

The very small man is often very fit, possibly a long-distance runner or cyclist, and makes a good soldier. He should be accepted without hesitation unless any pathological condition is found. (I have been impressed with the fact that the man with very poor physique about whom one is pondering as to grading while he is on his passage by the various examiners often has albuminuria.)

Hydrocele is sometimes a difficulty because of the possibility that the testicle may be diseased. If hydrocele has only existed a few months it should be regarded with suspicion, but a strong healthy man who has had one for years can hardly be suffering from any serious disease of the testicle.

Examination deferred.—The chairman has power to defer examination if treatment is being carried out. I make a practice of asking men with varicose veins, septic tonsils, or hernia if they are willing to have an operation, and if so to defer examination for a sufficient time. Men undergoing dental treatment are given time for a denture to be fitted.

Letters to Doctors.—I have already dealt with albuminuria cases. I always write and ask for the opinion of the man's doctor in cases of epilepsy and where there is doubt as to the history given, and particularly in cases of mental breakdown. When anything serious is found for the first time I tell the man that there is something wrong and ask him to go to his own doctor, who will be informed. Grade IV certificates become the property of the recruit, and it is well to avoid such term as "mental deficiency" if possible. Certificates from doctors are brought by recruits, and most doctors wisely refrain from expressing an opinion as to fitness for service and content themselves with a statement of the conditions found. A record of these is kept, and it was observed in the last war that a few doctors gave many more certificates of unfitness than the average. The board, however, frequently asks for a statement from a doctor, and these we file not as certificates but as "Information asked for."

Unfitness to Attend for Examination.—A certificate that a man is not fit to attend for examination may be accepted by the chairman and attendance excused or deferred. I feel strongly that any man should come for examination whose condition will not be harmed by so doing. Any man who has had mental disease should be excused attendance after verification of history. The chairman has power to examine cases himself if he thinks fit. I exercise this in cases of mental deficiency and certain cripples who are sensitive about their condition, and obtain a formal approval from other members of the board without going through the routine examination.

Notes in Conclusion

I think that twenty-five is the proper number of cases to be examined at a session. This took us from two and a half to three hours. We speeded up to thirty when war started, but I do not think that three hours for a session should be exceeded, because when doctors are tired mistakes are more likely to happen.

Finally I should like to testify how smoothly the work has gone. When one knew at the beginning that the three combatant Services were involved, that the Ministry of Labour was making most of the arrangements and supplying the clerks, and that supervision was to be exercised by the Ministry of Health, one expected friction, but there has been none. The Ministry of Labour has supplied us with clerks who have always been most helpful and courteous to those undergoing examination, some of whom are occasionally not easy to deal with.

Post-vaccinal Tetanus.—Death occurred from tetanus in the third week after calf-lymph vaccination of a child aged 7. The dressing had been removed on the second day and replaced by a lettuce leaf, which was renewed daily. The incubation period of the tetanus was eight days.—Post-vaccinal Tetanus, Recchia.—*Policlinico* (Sez. Prat.), July 3, 1939, **46**, 1228.

"WAR AND THE MEDICAL SERVICES"

This is the title of a pamphlet recently issued by the Labour Research Department which represents the work of a committee set up by three bodies—the Socialist Medical Association, the Left Book Club Medical Group, and the University Labour Federation. According to its authors this pamphlet is based not on statistics but on individual letters and statements—a somewhat rickety foundation for reasoned argument, but a good starting-point for the wholesale abuse of the state of things that are.

The Attack

The Ministry of Health is bitterly attacked for its medical arrangements in connexion with the evacuation of the civil population. According to this pamphlet there was no real organization of the arrangements for billeting and education. No medical examinations were made either before or immediately after evacuation. Special clinics had to be set up to deal with scabies and lice. Impetigo became epidemic. Overcrowding made matters worse. It is alleged that the Ministry of Health made no attempt whatever to organize medical attention for the evacuated children and mothers. The Emergency Medical Service is criticized with equal harshness. The base hospitals were not ready. The immediate effect on the care of civilian sick was tragic. The steps taken at the beginning of the war were concerned solely with the provision of a number of casualty beds ordered by the authorities. "The suffering and hardship caused can only be appreciated," so the jeremiad runs, "in terms of the fate of individual patients multiplied a thousand times." In so far as it related to medical education the whole scheme, it is alleged, was designed to allow as many students as possible to become qualified quickly without reference to their ability.

Indeed, the first fourteen pages of the pamphlet provide a vigorous, if reckless, attack mainly directed at the Ministry of Health, the local authorities, and the voluntary hospitals. The story proceeds and more culprits appear in the form of vested interests. These include the insurance companies which have made loans for the purchase of practices, the patent medicine manufacturers, and important sections of the medical profession. "The higher ranks of the medical profession contain, even now, many eminent men of influence with a firm faith in the need for the preservation of the voluntary hospitals and the private practice system. . . . They are afraid of organization, yet they are really interested in the progress of medicine." There is increasing evidence, the pamphlet states, of attempts to bolster up the voluntary hospitals in opposition to hospitals in the hands of municipal authorities. The National Government is pilloried. This Government, it is stated, has never taken any serious steps to organize the health services of this country. "There is evidence that the Ministry is trying to carry out the policy of reducing expenditure on all health services. It is combining this with a desperate attempt to preserve the voluntary system."

The Recoil

It is only as we pass to the end of the pamphlet that its true purpose is revealed. The Ministry which failed the evacuated children and mothers, which created the Emergency Medical Service so bitterly assailed in the pamphlet, should become the controlling authority of a State medical service. The local authorities, severely criticized for the inadequacies of their medical services and for their failure to co-operate with the medical profession, are, under the central authority, to administer the health services of the country. The only ground for support to this curious conclusion to an argument that would seem to point in the opposite direction must surely lie in the saying: "To understand all is to forgive all."

The pamphlet concludes with certain proposals vaguely—and briefly—stated. The insurance principle should be extended to dependants and others, the income limit being raised to £500 a year. Private practice would not be abolished, but the panel as such would be, and the insurance doctor would become a part-time or a full-time salaried family doctor. Health services would be controlled by local authorities and co-ordinated on a regional basis. What is to happen to the voluntary hospital is not clear, although obviously it is intended that it should disappear.

No one can deny that mistakes were made in the early months of the war—by Government Departments as well as by citizens. And a slow-motion war has given arm-chair critics the opportunity they have been waiting for. It is child's play to criticize the working of schemes devised to meet circumstances that never in fact arose. No one attempts to deny that there are gaps, deficiencies, and overlappings in our present health services. But to use any stick with which to beat Governmental authorities, pillorying them for incompetence, ignorance, and negligence, and in a second breath to urge that these same authorities should assume control of all health services is, to say the least of it, a little Gilbertian.

General Medical Service for the Nation

The need for a General Medical Service for the Nation is clearly recognized and has been discussed in great detail in a report issued by the British Medical Association. The regionalization of hospitals, both voluntary and municipal, is proceeding apace, fortified by the munificence of Lord Nuffield. The medical benefits obtainable under national health insurance should be amplified so as to make them complete and available to others. Local medical services should be co-ordinated and amplified. These are the main lines of the B.M.A.'s proposals. In advocating them there is no need to resort to exaggeration or inaccuracy. The plan does not depend on the rise or fall of this or that Government. And the proposals were put forward before the outbreak of war demanded that, at least for the present, the whole of the energies of the medical profession and its organization should be concentrated in a supreme war effort.

Free Choice of Doctor

The Socialist Medical Association, one of the three bodies responsible for this polemical pamphlet, has published in the December issue of its journal, *Medicine To-day and To-morrow*, an entirely different presentation of the case. Perhaps this difference is accounted for by the fact that, while the composite document is intended mainly for the general public, the other is directed to the medical profession.

The memorandum of the Socialist Medical Association merits careful study. It is a brief but comprehensive survey of the various proposals which have been put forward in recent years for the reorganization of the country's health services. The British Medical Association's proposals for a General Medical Service for the Nation, Dr. E. R. C. Walker's plan, the *Lancet* commissioner's plan for hospitals, the Labour Party's proposals, and the so-called Walton plan are clearly and

succinctly presented. It concludes with a statement of the leading points on which there is substantial agreement —a statement which is both informative and impressive.

But throughout these summaries there is scarcely a reference to the principle of free choice of doctor. If this principle is set aside as of no account it is not difficult to reconcile those proposals for reorganization which retain the general practitioner as their pivot. But the inescapable fact is that the confidence of a man in his doctor is an essential element in the efficient prevention and treatment of disease. Ignore this fact and it is not difficult to draw up, at least on paper, an attractive scheme of medical service in which the State is paramount, the doctor its employee, and the citizen the recipient of advice and treatment by a doctor selected for him by the State. Such a service may be centred on the hospital, the clinic, or the consulting-room. It may provide guaranteed holidays and pensions. But it will probably fail in the ultimate test—that of providing the best possible service for the individual citizen.

THE MEDICAL RESEARCH COUNCIL

MEDICINE IN RELATION TO WAR

The annual report of the Medical Research Council published this week[1] is not a report which carries on the story in sequence, chapter after chapter, but statements of work in progress are included from a hundred different centres, and therefore cognate researches may be described in widely separated sections.

The introduction calls attention to the main problems which have occupied the researchers during the year, and this is followed by a specific account of the work of the National Institute for Medical Research at Hampstead and Mill Hill. The proposed concentration of the whole activities of the Institute at Mill Hill, by the way, has been delayed by the war, but the separate nutrition block and some ancillary buildings are already in occupation and the shell of the main building is complete. The work at the Institute during the year has included "progress" investigations on virus diseases, immunology, chemotherapy, and endocrinology, and the publications coming from the Institute itself or members of its staff which have appeared in various journals have numbered nearly one hundred. This is followed by an account of the related work on biological standardization which is going on both at the National Institute and at the Standards Laboratory at Oxford.

The clinical research units which are supported by the Council are separately noticed; these are at University College Hospital, Guy's Hospital, and the National Hospital in London, and at the Royal Infirmary and other hospitals in Edinburgh. Next comes the work of the external scientific staff maintained by the Council to undertake researches elsewhere than in its own central institutions; this is proceeding at fifteen places in different parts of the country. Some thinning has taken place, not in the work itself but in the reporting of it, in the next section, which describes the researches aided by Council grants. In previous years these numerous investigations conducted by individuals or groups have been set out in full detail; this year there is only a list of the grantees, their subjects, and the papers published by them in medical literature, numbering some three hundred. The work on tropical medicine is relatively an infant so far as the Council is concerned, the programme of research in this field having been adopted only four years ago after consultation with the Colonial Office. The investigations this year have been chiefly on trypanosomiasis and yaws, and some nutritional surveys have been carried out in Nyasaland. The report of the Industrial Health Research Board, a subsidiary of the Council which has been occupied largely with industrial pulmonary diseases, completes the record.

[1] Report of the Medical Research Council for the Year 1938–9. Cmd. 6163. H.M. Stationery Office. (3s.)

Special Researches on War Problems

Of the thirty-five investigation committees on special subjects which are working under the auspices of the Council, six have reference to the war emergency. These are concerned with immunological supplies, public health laboratory services, blood transfusion, wound shock, and war-time therapeutic requirements. The Council has also accepted responsibility for the registration of all pathologists and medical bacteriologists, and of expert technicians in the same subjects, for war service. For two years before the war the Council was engaged in discharging a number of responsibilities on behalf of the Government in preparation for the possible emergency.

A few special researches on war problems are mentioned. One of these is the question of shock occurring after severe wounds or operations. It is considered certain that the more recent developments of blood transfusion, together with a well-organized service for allowing this to be carried out on a large scale, will lead to results far better than those obtained by the transfusion of gum acacia solution introduced in the latter part of the great war.

Again, the modern discoveries in the chemotherapeutic treatment of bacterial infection will no doubt be one of the outstanding beneficial factors in dealing with war casualties. A matter which calls for early solution is the possible prophylactic effect of sulphonamide derivatives, and arrangements have been made by the Army Medical Service to determine whether the administration of these compounds immediately following injury will prevent serious infection by the more common pathogenic micro-organisms. In pneumococcal pneumonia their use may effect a substantial reduction in the death rate and in the time spent in hospital. It will indeed be a triumph if the results of the treatment of pneumonia in civil life can be repeated under military conditions.

Further Work on Chemotherapy

The price of any therapeutic advance is continued vigilance, and there is always the possibility that new remedies, despite their great achievements, may conceal dangers not immediately apparent. In this connexion a certain warning note is sounded from the research unit at Queen Charlotte's Hospital, where the application to puerperal infections of drugs of the sulphonamide group has been investigated under Drs. Leonard and Dora Colebrook. Since the beginning of 1939 all puerperal fever patients infected by haemolytic streptococci have been treated by sulphapyridine (M & B 693), for comparison with the results obtained in previous years by red prontosil and sulphanilamide. In regard to this drug and the other members of the sulphonamide group particular attention has been directed in recent months to the danger of a harmful effect upon the blood-forming organs, resulting sometimes in a fatal agranulocytosis. Among nearly 600 patients treated at Queen Charlotte's during the past three and a half years this harmful effect has been detected four times—happily only once with a fatal result. An attempt has been made to induce a similar effect upon the blood-forming system of animals, and other experiments have been made to determine which of the sulphonamide preparations is least liable to exert this harmful effect, and whether the doses employed hitherto have been larger than is necessary. Apparently the investigators are not yet in a position to furnish positive results. Routine testing (*in vitro*) of a number of strains of streptococci isolated from puerperal infections has brought to light the interesting fact that patients who do not make the usual satisfactory response to treatment by sulphanilamide are in many instances

infected by cocci which are demonstrably insensitive to the drug. It is hoped that a comparison of the biochemical properties of these strains with those of sensitive strains may help to explain how the drugs affect the metabolism of these and other micro-organisms.

Evidently, while the recent development of chemotherapy in dealing with bacterial infections gives hope of great success in treating sepsis in war wounds, the new methods will have to be carefully controlled at first so that the results may be evaluated and the best conditions for their use determined.

Physiology of High Altitude Flight

Another piece of special research on a war problem concerns the physiology of aviation, which, of course, takes on a new aspect when it is a question of flying modern war machines. At the National Institute Dr. Argyll Campbell has carried further an investigation arising from the observation that rats fed on carrots alone will survive exposure for an hour to a tension of oxygen so low as to be rapidly fatal to rats receiving a normal mixed diet. Such an effect of diet has an obvious potential importance in relation to the physiological problems of flying at high altitudes, and a systematic effort has been made to identify more clearly the dietary constituents which thus favour, or on the contrary depress, resistance to oxygen deficiency. A high protein content of the diet has been found to be generally unfavourable to resistance, an exception being the zein (proteid) of maize, which has a protective effect. The main conclusion is that resistance is promoted by decreasing the proportion in the diet of protein and increasing that of carbohydrates, and particularly of vegetable and fruit fibre.

On nutrition in general a great deal of work is proceeding and derives a new importance from the national situation. At the Lister Institute some work on the preservation of fruits suggests the desirability of adding synthetic ascorbic acid to canned products, which naturally contain sufficient quantities of vitamin C but which will become inadequate in this respect after prolonged storage. One other piece of work is quoted from Queen's Hospital for Children, London, where a member of the Council's external staff, Dr. Helen Mackay, has found that infants getting a mixture of equal parts of soya flour and dried milk grow nearly, if not quite, as well as babies wholly on a dried milk diet. They have a similar morbidity rate and they have a higher haemoglobin level than babies given unmedicated dried milk.

Immunity to Tetanus

While the needs of the war stimulate inquiry, those who control the work of the Council feel the danger, in switching over to work of immediate practical interest, of losing promising research unrelated to the war. Yet almost every subject has its war angle. Take, for example, the work on immunology. The value of the detoxicated preparation of tetanus toxin in producing active immunity against tetanus in man and animals has rapidly gained recognition, and its importance in protecting troops against one of the major risks of warfare needs no emphasis. Dr. Percival Hartley, director of biological standards at the National Institute, has been co-operating with Professor Ciuca of Bucarest in evaluating the immunizing effect of preventive inoculation with tetanus toxoid. Before the issue of this preparation could be authorized under the Therapeutic Substances Act it was necessary to lay down in full detail the tests to ensure that every batch had been freed from the specific toxicity of the patent toxin, had retained adequate potency as an immunizing antigen, and was perfectly sterile. The tetanus antitoxin present in the sera of a large number of subjects who had received immunizing injections of the tetanus toxoid under different conditions as regards dosage and time intervals between injections has now been ascertained, and the results confirm those obtained in other countries that the toxoid is a very efficient immunizing antigen, and that it can be given in combined injection with a bacterial vaccine without any impairment of its immunizing efficiency. Of particular practical importance is the fact that, when a basal immunity has once been established by a primary immunization with the toxoid, a small injection given after as long an interval as two years will produce a rapid and large increase in the tetanus antitoxin circulating in the blood.

Studies of Influenza

Epidemic studies of influenza and of other virus diseases have been continued at the National Institute. In the early part of last year a disease recognized clinically as influenza appeared in the form of a series of outbreaks—not as a general epidemic over the country—in certain cities or districts, but in those localities the incidence was sometimes as high as 50 per cent. The outbreaks presented a mixture of clinical types, many being such as to suggest a diagnosis of nasopharyngitis or bronchial cold, while others had all the characters previously regarded as typical of influenza. Even with material from typical cases all attempts to transmit a virus infection to ferrets and mice were at first unsuccessful, but later the virus was recovered from a proportion of the cases in each outbreak visited. The presence of virus was not associated with a greater severity of symptoms; on the contrary, as judged by duration of fever or chest involvement, the attacks had a somewhat greater average severity in the cases in which virus was not detected.

It is considered to be clear that between the well-defined epidemics of influenza associated with the transmissible virus less typical and milder outbreaks may occur in which other causal agents—viral or bacterial—predominate, and that in such a relatively mild outbreak the previously recognized clinical distinction between the true influenza yielding transmissible virus on the one hand and febrile catarrhs due to different types of infection on the other does not hold good.

Some further work has been done on experimental vaccination against influenza, but so far, owing to the absence of a typical outbreak among the boys of a naval establishment, of whom half had been vaccinated and the other half had not, no significant results have been obtained.

(To be concluded)

The Board of Registration of Medical Auxiliaries has recently recognized the British Orthoptic Society as a qualifying body in orthoptics, and members of the society have been enrolled in the National Register of Medical Auxiliary Services. This branch of medical auxiliary work (that is, the treatment of squint) is a method of corrective treatment carried out in special orthoptic departments of hospitals, in special clinics, and privately by orthoptists who have qualified through the British Orthoptic Society and who have been granted a certificate of proficiency by the Council of British Ophthalmologists. Treatment is undertaken only under the direction and control of an ophthalmic surgeon or a registered medical practitioner engaged in ophthalmology. The number of registered orthoptists is small, but this fact emphasizes the need for the Register in that ophthalmic surgeons, etc., can ascertain at a glance the name and address of the nearest qualified and registered orthoptist. The Register is issued free to the medical profession, hospitals, etc., and a copy can be obtained on application to the Registrar, Board of Registration of Medical Auxiliaries, British Medical Association House, Tavistock Square, London, W.C.1

Reports of Societies

INDUSTRIAL MEDICINE IN WAR TIME

At a meeting of the Association of Industrial Medical Officers held on January 26, Dr. R. E. LANE (Manchester), the newly elected chairman, presiding, a discussion on war-time problems in industrial medicine was opened by Dr. E. H. CAPEL (Birmingham) and Dr. D. STEWART (Birmingham).

Dr. Capel said the lay mind thought that output in industry might be increased by working long hours and encouraging workers to "put their backs into it." The fallacy of expecting output to increase in proportion to the hours worked was proved during the last war, and the publications of the Health of Munition Workers Committee supported the contention that overtime must be limited. He drew attention to the effect of travelling time, pointing out how often the journey to and from work was long enough to make an otherwise harmless day too long. He also called attention to the fact that many industrial hazards became greater risks when workers were over-exposed to the hazard as the result of overtime and pressure of work. For instance, the number of cases affected by lead, as judged from the punctate basophil count, rose after an increase of working hours. Night work was necessary in many industries to-day, but it had been disputed whether this should be done in short or long spells. This must depend upon local circumstances, and it was difficult to lay down rules.

Dr. Stewart said that many of their problems originated from the black-out. Ventilation and lighting assumed a new importance. Accidents happened which normally would not occur. He touched on the question of night blindness in relation to accidents, saying that it might possibly be countered by suitable adjustment of diet, and commented on the need for revision of legislation for workers' compensation, particularly the provision for adequate treatment and for the co-ordination of treatment and rehabilitation. Mr. HAROLD CLAY of the T.U.C. remarked that there was now much better co-operation between employer and employed than in 1914, and the organization of industry and the avoidance of bad conditions should be greatly facilitated as a result. He endorsed the remarks of the previous speakers on the dangers of working excessive overtime. Most workers did not like long hours, even though it meant a larger wage packet. They must remember, however, that many workers in the heavy industries had within recent times had long periods of unemployment, and the tendency to take the chance of earning good money while there was an opportunity was quite understandable. He advocated "staggered" hours to deal with the transport problem. Many workers did not object to night work, and to some the extra money paid for this was sufficient compensation for its disadvantages. Mr. R. R. HYDE of the Industrial Welfare Society said that there was a marked difference in outlook to-day compared with that in 1914. During the last war industry placed its greatest emphasis upon obtaining profits, and trade unions on obtaining larger wages. He was happy to say that in 1940 both were considering other important problems, such as the health of the worker and how this could benefit the nation. He spoke of the importance of getting industry to realize how vital was the message the medical profession had for it.

Air Vice-Marshal Sir DAVID MUNRO spoke of the interest which was being taken by important Government officials in the very problems which were being discussed at the meeting; industrial fatigue was one of these. The wage incentive must not be allowed to climb at the expense of long hours and damaged health. He stressed the importance of the industrial doctor in the safeguarding of health in industry. Mr. H. E. GRIFFITHS said that rehabilitation of the injured person should have the attention of the surgeon from the earliest stage of treatment. Occupational therapy should be arranged so that the patient was not on his own work, and any therapy or exercises given should distract the patient's attention from the injury. He found competitive games cheap and effective in re-education after injury. Professor MILLAIS CULPIN felt that many cases of night blindness were psychogenic in origin; the subject should not be given too much prominence or an epidemic of it might be precipitated. Mr. R. WATSON JONES referred to the importance of the adequate treatment of shock and of the value of a properly heated shock room for the reception of casualties. In rehabilitation the difficulty of obtaining suitable light work was a big one. "Light work" was not always satisfactory. The work provided should be suitably graded so as to offer the greatest chance of recovery. The co-ordinated treatment of industrial injuries and well-organized fracture clinics were never more necessary than at present.

Local News

ENGLAND AND WALES

Radiographers at Dinner

The Society of Radiographers held its annual dinner as usual at the Connaught Rooms, London. A large company of members and their friends, some of them from as far afield as Scotland, Lancashire, and the West of England, assembled under the chairmanship of Dr. G. W. C. Kaye, who, in welcoming the guests, mentioned that they included Lieutenant-Colonel D. B. McGrigor, president of the British Institute of Radiology, who was now Adviser in Radiology at the War Office, Mr. W. E. Schall, chairman of the Association of *X*-ray Engineers, Mr. V. E. A. Pullin, Radiological Consultant to the Air Ministry, Dr. A. E. Barclay, consultant adviser in Radiology to the Ministry of Health, and Major R. W. Gemmell and Dr. J. Blair Hartley, chairmen respectively of the Liverpool and Manchester Radiographic Societies. Colonel McGrigor, in responding, congratulated radiographers on the home front for generally making the best of things and endeavouring to carry on, though "business as usual" was not always possible or even desirable. Many of their number had had to realize that obligations entered into in peace time had now to be fulfilled. This applied not to radiographers only but to very large numbers of highly skilled technical people in all kinds of services, and he thought it well to bear that in mind when the difficulties which might arise in connexion with their work appeared unduly oppressive, and so simplify the task of those directing the campaign. These difficulties were the subject of sympathetic consideration by the authorities. Radiographers on service abroad, in spite of the absence of big events at the front, were not exactly living a life of ease. They were engaged less on pure radiography than on building up their *x*-ray departments, making them as good and efficient as possible in readiness for any occasion that might develop. They might find themselves placed in newly erected huts, or in adapted old buildings, or in tents pitched on muddy ground, in striking contrast to the environment in which they worked at home. Mr. W. E. Schall, who also responded, thought it significant that "while the dictators were screaming over Europe" radiographers, with a calm and unruffled exterior, had said, "Let us have our annual dinner." He made play with the divers occupations in which many prominent radiologists and radiographers were now engaged, and said that it seemed to him that few of the really important activities in which the nation was taking part were not being controlled by one or other of their number. Colonel J. Struthers Fulton, head of the radiology department of a hospital "somewhere in Great Britain," created amusement by mentioning the varied and at first sight unrelated duties which now came his way—these included the running of a laundry and the charge of a market garden of ten acres. He added that the radiological services in the Army were exceptionally fortunate in having at the War Office Colonel McGrigor, who had shown great foresight in planning the radiological equipment and personnel. He hoped that many of the civil radiographers he was

addressing would find their way into the Army service, where a varied experience which would stand them in good stead in their later career was to be obtained. The toast of "The Society of Radiographers" was proposed by Mr. V. E. A. Pullin, who remarked that the practice of radiography called for many attributes. It rested on a wide basis of scientific knowledge, demanded great experimental ability, ingenuity, and foresight, and above all things required patience and adaptability.

Chadwick Lectures

The following public lectures have been arranged by the Chadwick Trust: Tuesday, March 12, 2.30 p.m., at London Missionary Society, 42, Broadway, Westminster, S.W., Dr. T. N. V. Potts, "The Role of Women in the Public Health Service To-day"; Tuesday, April 9, 2.30 p.m., at the Royal Society of Tropical Medicine and Hygiene, Mr. W. H. Hamlyn, "Camps: Their Design, Construction, and Hygienic Arrangement"; Tuesday, May 21, 2.30 p.m., at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C., Professor S. P. Bedson, F.R.S., "Human Virus Infections of Animal Origin: Their Mode of Spread and Control"; Thursday, June 20, 4 p.m., at the Chelsea Physic Garden, Swan Walk, Chelsea, S.W., Professor William Brown, F.R.S., "Plant Disease in Relation to the Public." Admission to the lectures is free, and further particulars may be obtained from the secretary of the Trust, 204, Abbey House, Westminster, S.W.1.

SCOTLAND

Scottish Red Cross Society

Lord Kinnaird, chairman of the Scottish Branch of the British Red Cross Society, has received a letter from Mr. John Colville, M.P., Secretary of State for Scotland, thanking him for the society's offer to provide hospital supplies and comforts for use in hospitals included in the Emergency Hospital Scheme in Scotland. At the society's request work parties are now engaged in making bed jackets, dressing gowns, bed and operation stockings, knitted bed wraps, and over thirty other types of article.

Scottish Blood Transfusion Service

The Department of Health for Scotland announces that a council, under the chairmanship of the Earl of Rosebery, has been formed to take over and administer the Blood Transfusion Service in Scotland. Mr. John Colville, M.P., Secretary of State for Scotland, was responsible for setting up a national service at the outbreak of war, and the new council's function will be to complete the organization. The council consists of about thirty members. Its task will be to co-ordinate the work of the local voluntary committees recently set up in various centres in Scotland and to appeal to the public for money to carry on the work. In Edinburgh, Glasgow, Dundee, Aberdeen, and Inverness depots for the storage of blood have already been created. These depots can be expanded rapidly should the need arise. The Department of Health will continue to meet the cost of the service until the end of this month. Although the public will now be appealed to for funds, the State will continue to support the service.

The fifteenth annual report of the executive committee of the National Institute for the Deaf has been issued from the headquarters at 105, Gower Street, W.C.1. In a speech made at the annual meeting held on October 6 Sir Francis Fremantle outlined the many ways in which the Institute might be of service to the cause of the deaf and deafened, both combatants and civilians, during the course of the war. The report prints the inscription to the memory of Arthur John Story (secretary of the Institute from 1925 until his death on September 11, 1938) which appears on a plaque placed in the Leo Bonn Hall. It commemorates Mr. Story's unflagging zeal in the cause of the welfare of the deaf during forty-two years.

Correspondence

The Tourniquet

SIR,—Mr. Malcolm Donaldson (*Journal*, February 17, p. 273) is wise in drawing attention to dangers resulting from misuse of a tourniquet, but I am afraid he is too optimistic when he states that "fear of tourniquets is unnecessary, as in this country it is unlikely that any patient will be left for more than half an hour from the time of accident to the time that he arrives in hospital." Within the past fortnight I have been forced to amputate an arm of a man who received an open fracture of the forearm at 5 a.m., and to which a tourniquet had been applied immediately. Although the accident occurred at a place only about five miles away, it was not until 8.15 a.m. that he arrived in hospital and the tourniquet was released (needless to say, there was no bleeding when this was done). During this interval the tourniquet had been loosened on one occasion only. Primary débridement was carried out, but the hand remained cold, numb, and paralysed, and the forearm painful, and in spite of the fact that the main vessels and nerves were intact amputation was necessary the next day.

By all means use a tourniquet, but remember and teach that often a pressure bandage over a first-aid field dressing and splinting to prevent gross movement will achieve all that is necessary. If a tourniquet is applied, mark on the patient's forehead or on a label fixed to the patient the time that the tourniquet was applied, and also the time it should be released. Many lives will be saved by proper use of a tourniquet, but many limbs will be lost by its improper use.—I am, etc.,

Feb. 18. RALPH SHACKMAN.

Penetrating Chest Wounds

SIR,—It would appear that Dr. Hood has not quite grasped the drift of my observations on the "early closure" of such wounds. The value of early operation and the invaluable work done on these lines at the various casualty clearing stations is not in question. The point is whether, after operating on a case in which, owing to the nature and circumstances of the wound, the pleura has in all probability become heavily infected, it is wise to effect complete closure of the wound, or to institute some form of drainage either at the operation wound itself or by a separate incision in the postero-lateral region of the chest wall.

The subsequent history of such cases suggests that some form of drainage is advisable, and I gather that Mr. Oswald Tubbs, basing his opinion on experience of chest surgery in civil practice, thinks likewise. I quite agree that the cases of early closure mentioned by me are not sufficient to warrant one in coming to any hard-and-fast conclusion. I never suggested they were.

In reply to Mr. Oswald Tubbs, there is no doubt that deflation of lung (homolateral collapse) is accompanied by displacement of the mediastinum towards the lesion, as shown by *x* rays and the position of the cardiac apex—a point that was accidentally omitted in my paper. Though homolateral collapse may possibly be due to bronchial obstruction by mucus or blood, it appears doubtful, because the condition is more commonly associated with non-penetrating chest wounds in which there is no direct injury to the lung. I agree that it does not get us very far to say that "the lung appears to be stunned by the concussion," but I am afraid that is as far as I am able to go towards explaining the condition.

In reference to methods of drainage, if it is possible (as Mr. Oswald Tubbs suggests) to keep a long and heavy drainage tube in position by a large safety pin strapped to the chest, or in any other way to obviate the necessity of actually stitching the tube to the skin, the objection to this method, that it causes constant severe pain, would be removed, and water-seal drainage would be obviously preferable to the "glove-finger" method referred to by me. Owing to the

weight of the tube and probable restlessness of the patient any method of fixation would require to be fairly strong. It occurs to me that the difficulty might be partly overcome by substituting for the distal part of the tube a length of light flaccid tubing such as is commonly employed with a Paul's tube when performing enterostomy. In any case, a diaphragm of sheet rubber or jaconet to prevent air entering the chest round the drainage tube would be advisable, as however closely the wound is stitched round the tube it tends to yield slightly and allow air to enter the chest after a few days.

In reply to Dr. Barcroft Anderson, I have no experience of the use of iodoform applied inside the thoracic cavity. The possibility of iodine poisoning suggests that chlorine—in the form of Dakin's solution, which has proved its value—is a more satisfactory antiseptic to use.—I am, etc.,

Bath, Feb. 13. F. G. THOMSON.

Endotracheal Anaesthesia

SIR,—This discussion appears to be getting lost among unprofitable bypaths, but it seems to be worth while to settle once and for all the original question raised by Sir Robert Kelly. Put briefly, this question is, "Why have anaesthetists all over the world abandoned the original insufflation endotracheal technique introduced into this country over a quarter of a century ago by Sir Robert Kelly and have adopted the inhalation technique?" The answer is that (*a*) insufflation endotracheal anaesthesia is physiologically unsound, and (*b*) it does not, *per se*, afford any protection against the aspiration of fluids into the air passages. There are also various subsidiary reasons, most of which have been already mentioned by Sir Harold Gillies and others.

Let us take these two assertions in order. Man normally breathes an atmosphere containing no appreciable CO_2 at the level of his nose and lips, but owing to the considerable dead space of his respiratory passages the CO_2 percentage gradually rises as we go downwards, until it reaches the approximate figure of 5.6 per cent. in the alveolar air. If a narrow-bore catheter is now inserted through the glottis with its end at the tracheal bifurcation and a constant stream of air or oxygen is blown through it under pressure, it is obvious that the dead space will be greatly lessened and the alveolar CO_2 concentration will fall, with consequent shallow respiration or complete cessation (acapnia). This is the state of affairs occurring in insufflation anaesthesia, and may appear very desirable to a surgeon performing an intricate upper abdominal operation. Many years ago, however, I showed that, if this condition is allowed to persist, the blood pressure always falls, the pulse rate rises, and pallor, sweating, and all the other signs of shock occur, although cyanosis is absent. The most probable explanation of this phenomenon is the imperfect filling of the heart resulting from cessation of the "respiratory pump" effect, although oxygenation of the blood will continue from diffusion in the absence of any respiratory movements.

The other assertion, that insufflation does not afford sufficient protection from the inhalation of fluids, is also unquestionably true, in spite of Sir Robert's experiments with charcoal in dogs' stomachs. About twenty years ago I showed by bronchoscopy that blood was invariably present in the bronchial trees of patients after dissection tonsillectomy and nasal septum resections performed under insufflation anaesthesia. The size of the catheters and the pressure used made no difference, and I believe that the outside of the tube passing loosely through the glottis actually afforded a channel down which the blood trickled in spite of the "return blast" of the gases. The only solution to the problem at that time was to pass a second (expiratory) tube just through the glottis and to use a gauze pack. This method was effective, but difficult to carry out without trauma.

The wide-bore inhalation technique introduced by Magill was, in my opinion, one of the greatest advances in modern anaesthesia. The method is a physiological one in that the respiratory dead space and tracheal pressures are not appreciably altered, while by simple packing, or, more recently, by inflatable ballooned tubes, the system is rendered gas-tight without trauma. As an example of this, a girl of 15 was recently anaesthetized for six and a half hours with this technique for the removal of a cerebral tumour. During the last six hours pure nitrous oxide and oxygen were used. Within thirty seconds of removing the tube at the end of the operation she asked in a perfectly clear voice for a drink of water.

Such questions as nasal or oral intubation, and the anaesthetic agents and circuits employed, are not really relevant to this discussion, and I do not propose to refer to them. I can, however, assure Sir Robert Kelly that it is not mere fashion that has altered the technique of endotracheal anaesthesia.—I am, etc.,

St. Albans, Feb. 15. C. LANGTON HEWER.

Anaesthesia in War Time

SIR,—In the interesting and practical article on war-time anaesthesia by Professor R. R. Macintosh and Dr. Freda Pratt (*Journal*, December 2, 1939, p. 1077) there are two matters about which I would be grateful for some elucidation.

In the diagram (Fig. 1) of their emergency apparatus an endotracheal tube is connected by a length of rubber tubing to an "ordinary tin" containing ether, in the lid of which are two or three small holes. Assuming that there is a minimal movement of air between the endotracheal tube and the vocal cords, the system set up by the above apparatus is one in which the patient simply breathes in and out over the surface of ether in a tin. The question arises whether the mere to and fro passage of inspired and expired air over the surface of ether is sufficient to maintain third-stage anaesthesia for any length of time, as would be required in the case of long operations. Obviously the ether vapour is not delivered under pressure, as from a Boyle's apparatus.

The second question arises when it is considered that in the system set up the column of dead-space air would appear to be greatly increased (it includes that contained in the tin above the surface of the ether). The volume of tidal air would therefore have to be increased by the patient so as to maintain adequate tension of oxygen in his alveolar air. (Any slight increase in CO_2 tension, on the other hand, would presumably be an advantage, by maintaining the bicarbonate content of the blood and guarding against acidaemia.) In actual fact, therefore, does the patient breathe more deeply? If not, are there ever any signs of anoxaemia?

The simplicity of the apparatus obviously has many recommendations both for the exigencies of war and in out-of-the-way parts where complicated apparatus is not available. Can Professor Macintosh say whether the apparatus was used extensively in the war in Spain, and with what success?—I am, etc.,

Redhill, Surrey, Feb. 13. D. LANDSBOROUGH, jun.

Teaching of Anaesthesia

SIR,—Dr. John Elam brings up in your issue of February 17 (p. 275) a question which has been giving anxiety to the teachers of anaesthetics for some time past. The inescapable fact is that an anaesthetic which is suitable to both patient and surgeon is usually not one which is of much use to the apprentice anaesthetist. It is too much to ask the patient to forgo the benefits of basal narcosis or the surgeon to do without the relaxation which follows successful intubation just so that the medical student may learn how to use a "rag and bottle." At the same time, it is beyond doubt that the only way to teach safe general anaesthesia is to train the student in simple methods.

None of us has found the answer to this problem, but we hope to know more following a discussion which is to be held by the Anaesthetics Section of the Royal Society of Medicine on Friday, March 1. The discussion is on "Special Factors governing the Choice of Anaesthetic in Teaching Hospitals," and presumably these factors are the students and his needs.—I am, etc.,

St. George's Hospital Medical School, Feb. 19. G. EDWARDS.

Treatment of Infected Burns

SIR,—The article by Surgeon Lieutenant B. C. Murless (*Journal*, January 13, p. 51) on the treatment of infected burns has given rise to some correspondence. The following experience may be of interest, as one of the cases was treated by an occlusive plaster.

During the earlier months of the war some dozen cases of cordite burns, mostly on the forearms, hands, and face, were treated. There was also a patient who had the soles of his feet badly burnt from crossing a red-hot deck. The burns were chiefly of the second degree. It was over six hours before they were treated with "tannic acid with flavine spraying," after cleaning. Three cases went septic and oozed pus from the edges of the tannic crust, which fluctuated. Nothing was done to evacuate this pus, the crust being allowed to separate by itself. This took ten to fourteen days, and healthy epithelium was found underneath. One patient had a swinging temperature for two or three days, but had little pain and felt surprisingly well.

The patient with the burnt soles of his feet developed an infection of the area, and also in a few days began to develop foot-drop, as he could not bear anything to support his feet. It was decided to put his feet in plaster over the tannic crust and sepsis. He had to be given a general anaesthetic. The following night's rest he described as being the best that he had had since being burnt. Unfortunately he had to be discharged to another hospital a few days afterwards. He apparently recovered without undue delay, but no details are available. Incidentally his transport problem was greatly eased by the application of the plaster, as his feet could be bumped without excruciating pain.

This man's experience suggests that any patient with burnt limbs would be more comfortable with plaster applied over the tannic crust even with sepsis present. Recovery may or may not be hastened.—I am, etc.,

C. R. G. HOWARD,
Feb. 5. Surgeon Lieutenant, R.N.V.R.

Night Blindness—A Further Warning

SIR,—While preparing a further edition of *Neuro-Ophthalmology* I have been reading the rapidly growing literature on night blindness and its apparent cure by vitamin A. I have been troubled in my mind about this, for in not one of my hospitals nor in my private practice have I found an absolute case of night blindness due to lack of vitamin A. What I have seen is a condition of keratitis with vascularization of the cornea and surrounding sclera due to lack of proper vitamin supply, and in each the night blindness was merely due to the mechanical obstruction of a cornea gradually growing opaque. With the corneal condition clearing up both it and night blindness were simultaneously cured. I have yet to see a case of absolute night blindness for which I would feel that the treatment alone should be by intramuscular injection of vitamin A as suggested by Dr. W. N. Leak (*Journal*, January 27, p. 151).

Professor Millais Culpin (February 3, p. 190) has given us a warning, with which I agree, that we should not encourage a widespread knowledge of night blindness. Like him, I did not come across a single case of night blindness in France during the last war among the soldiers in the B.E.F. Although Colonel Eason saw twenty-two cases in Egypt, and Sidney Tibbles says night blindness used to be a good excuse for missing duty, neither of these can definitely say that the night blindness they found was due to lack of vitamin A. I was fully prepared to see many cases of night blindness since the black-out was instituted, but I have been thoroughly disappointed, so I agree with Professor Culpin that "if we think of it now and talk enough about it we shall produce an interesting if costly epidemic, the material being ready in our civil population under present conditions."

Our Army, unlike others, in the last war was remarkably free from this condition. Let us help it to remain so.—I am, etc.,

London, W.1, Feb. 12. R. LINDSAY REA.

Night Blindness

SIR,—Professor Dible's experience of night blindness in France (*Journal*, February 17, p. 274) is important in view of the complete gap in our literature and the many and voluminous Continental accounts. If he is still interested (and I hope he is, for prophylaxis is important now) he will find an abstract of some of the Continental literature, and a discussion of the probable nature of the disorder, in my paper on the occupational neuroses (*Proc. roy. Soc. Med.*, 1933, **26**, 655). I tried to indicate to possible critics like Colonel W. J. Powell (who also wrote in your issue of February 17) that a belief in the existence of psychoneurotic night blindness did not exclude a knowledge of physical causes of the condition. In the above-mentioned paper is a note of its occurrence as part of a deficiency disease not only in the Mesopotamian but in earlier campaigns.

May I use a parable? A reveller, clinging to a wayside post, looked at an orange-tinted globe at the top of it and remarked, "That's a very tall policeman." "Come away," said his friend. "That's a Belisha beacon." "Don't care what you say," answered the first reveller; "there *are* some very tall policemen."—I am, etc.,

London, W.1, Feb. 17. MILLAIS CULPIN.

Efficient Pasteurization

SIR,—The Milk Nutrition Committee has issued its report and findings and declares "that pasteurization has no appreciable effect on the nutrient value of milk." In America and on the Continent there have been similar findings during the last few years.

A correspondent, Dr. E. B. Hazleton, in your issue of February 10 (p. 232) raises the question—"By what means is efficient pasteurization to be obtained?" There is a process which has been used for some years in many countries on the Continent but I believe is not widely known in our islands; at least I have not noticed mention of it in the *British Medical Journal*. It is the process of Dr. Henri Stassano, a member of the Pasteur Institute of Paris, and called after him "stassanizing." It distinguishes itself from the other systems in that it takes place in a completely closed pipe system through which the milk passes in quite thin layers (about 1 mm.), resulting in a quick and effective heating and without any air being admitted as well as without superheating any portion of the milk.

The plant is manufactured in different sizes to deal with large and small quantities of milk and is in use in institutions, hospitals, sanatoria, hotels, and creameries. I know at least one creamery in Eire where this process has been used for the past four years. I believe there are at least two such plants in operation in London.

A comparison in the *British Medical Journal* of Dr. Stassano's process with the other two methods would be of general interest.—I am, etc.,

Kilkenny, Feb. 10. JAS. P. HEALY, M.B.

"Why Drink Milk?"

SIR,—May I suggest that Mr. F. R. Brown's criticism of our babyish and unmammalian habit of drinking milk (*Journal*, February 10, p. 232) is destructive rather than constructive. I would be interested to know what substitute he has to offer for this familiar beverage. He mentions our knowledge of dietetics, vitamins, food deficiencies, etc., but unfortunately we cannot drink this knowledge with our tea and our porridge instead of milk. Possibly Mr. Brown would like us to follow the example of so many mammals and eat grass, or perhaps he favours mangold-wurzels!

I do hope that Mr. Brown is quite consistent in his views and that he carries them into practice himself. In this case he will of course go without clothes, as man is the only mammal which has cultivated this effeminate habit. One may

take it for granted, too, that Mr. Brown also eschews all use of the internal combustion engine and will rely, like the rest of mammals, on his feet for locomotion. Possibly, moreover, he will prefer to progress on all fours, as the peculiar upright posture which man's idiosyncrasy leads him to adopt is only shared by a few apes.

Would it be impertinent to draw Mr. Brown's attention to one conclusion from "our present knowledge of dietetics" which appears to be inescapable—namely, that the incidence of tuberculosis appears to vary directly with the standard of nutrition and that the state of nutrition of many of the children in this country is far from satisfactory? It is apparently the opinion of most dietitians that milk is the best way of remedying this deficiency. If Mr. Brown can suggest some equally effective, plentiful, and cheap substitute I should be very glad to hear of it.

In conclusion, surely the best method of reducing the incidence of bovine tuberculosis is efficient and compulsory pasteurization.—I am, etc.,

St. Mary Cray, Feb. 11. B. H. KIRMAN.

SIR,—The small boy, asked to explain his peculiar addiction, replied "It's clean, it's cheap, and I like it." The same reply is applicable to Mr. F. R. Brown, who asks in your issue of February 10, "Why drink milk?" The reply, of course, embraces the proviso that we refer only to pasteurized or sterilized milks. Even raw milk is not responsible for all bone and gland tuberculosis. Nor is every acid-fast bacillus found in butter a tubercle bacillus. Dr. G. A. Dawson's assertion (January 27, p. 146) that he has come across a high proportion of tuberculous butters conflicts with the authoritative report quoted by Professor R. M. F. Picken (*Journal*, April 2, 1938, p. 753).

Surely it is time that anti-milk and anti-butter zealots were "debunked." Dairy produce is desirable, palatable, and nutritious, but must be clean, and this is not impossible of achievement. The day of universal pasteurization is nigh, but will not be accelerated by ill-informed exaggeration.—I am, etc.,

W. HARTSTON,
Scunthorpe, Feb. 12. Tuberculosis Officer.

The Cost of Vitamins

SIR,—*Parturiunt montes; nascetur ridiculus mus.* Rarely has this been more aptly illustrated than by the recent pother over the deficiencies of non-vitaminized margarine. Notwithstanding the intervention of the Ministry of Food, the only people who profit seem to be the margarine manufacturers, who have had a spate of free editorial publicity, and the vitamin A and D producers, who have had a bulk market added to their sales overnight. The public merely pay another penny per pound.

Admittedly margarine is better with added vitamins than without; but it is pertinent to inquire how much better. No one seems to have noticed that the amount of vitamin D in margarine or the butter ration is at best quite small, whether compared with the human requirement or with the amount supplied by a moderate-sized herring or a good helping of tinned salmon. The weekly four-ounce ration, if of summer butter, supplies about 80 to 100 international units of vitamin D (calculated from Fixsen and Roscoe's tables). If this be doubled by using margarine as well the amount is 160 to 200 I.U. Bacharach and Drummond (*J. Soc. chem. Ind.*, Jan. 20, 1940) give the optimal requirement at the generous figure of 500 I.U. daily, which means 3,500 I.U. a week. From the figures so critically compiled by Fixsen and Roscoe it may be calculated that one good herring a week will provide approximately 3,000 I.U. of vitamin D, virtually the whole weekly requirement, even if no other source whatever of this vitamin be included in the diet. In this connexion one pound of tinned salmon, still quite freely available and widely consumed by the general public, will provide about 3,000 I.U. Personally I shall continue to rely on my weekly herring (leaving the tinned salmon for those who prefer it) rather than attempt to eat thirty-five people's ration of butter or the equivalent in vitaminized margarine.

The attached table shows the relative cost of buying vitamin D in the different foodstuffs.

Comparative Cost of Weekly Requirement of 3,500 I.U. of Vitamin D if obtained solely from Respective Articles of Diet

	Price per lb.	I.U. Vitamin D per lb.	Approximate Requirement lb. per Week	Cost per Week
	Pence			Pence
Butter	19	400 (good sample)	8–9	152–171
Margarine	9	400	8–9	72–81
Margarine	5	400	8–9	40–45
Canned salmon, Grade 1	19.5	3,000	1.2	23
Herring	6	5,700 or more	0.6	3–4

—I am, etc.,

London, W.C.1, Feb. 15. WYNDHAM E. B. LLOYD.

Agranulocytosis following Sulphapyridine Therapy

SIR,—The case of agranulocytosis following sulphapyridine (M & B 693) reported by Drs. B. Pringle, G. C. Dockeray, and R. H. Mitchell in your issue of February 10 (p. 212) once again draws attention to the necessity for observing certain primary rules in the use of this drug in the treatment of pneumonia. These are, first, that it shall be given intensively—that is, 8 to 10 grammes in the first twenty-four hours and 6 grammes in the second twenty-four hours; secondly, that it shall be so given for a short period only—for example, forty-eight hours; and, thirdly, that if a further course is considered necessary it should always be preceded and accompanied by frequent white blood cell counts. Cases of pneumonia which are going to respond to sulphapyridine—and most of them do—will do so within forty-eight hours of starting treatment if adequate doses are given, and if unpleasant complications such as the one reported are to be avoided dosage must be cut down promptly (to 1 or 2 grammes daily) as soon as the temperature falls.

Insufficient dosage may undoubtedly lead to an arrest of the pneumonic process with liability to a secondary spread of consolidation after a few days, and then the organism may have become "sulphapyridine-resistant" and further treatment will be both dangerous and ineffectual. Many cases are being admitted to hospitals now on the fifth, sixth, or seventh day of disease because of failure to respond to the inadequate doses (for example, 1 tablet t.i.d.) which have been prescribed at home. Though the total dosage and method employed by Drs. Pringle, Dockeray, and Mitchell are not inadequate in the above sense, it is permissible to consider that their total of 22.5 grammes given in six days might have been replaced by 18 grammes in three days and the secondary bout of pyrexia obviated. In several hundreds of cases treated at Dudley Road Hospital during the past two years, using the intensive method (2 grammes four-hourly for three or four doses, then 1 gramme four-hourly for twenty-four hours, and then ½ gramme t.i.d. for twenty-four or forty-eight hours), no such complications have been encountered, but cases which have not responded have had their sulphapyridine treatment discontinued promptly, and it has often been found that such pneumonias were not pneumococcal.

It would be interesting to have had the causal organism (or the type of pneumococcus) recorded in the case reported.

Dr. Dockeray and his colleagues are to be congratulated on the happy conclusion resulting from the blood transfusion and pentnucleotide therapy.—I am, etc.,

Birmingham, Feb. 12. WILFRID F. GAISFORD.

SIR,—In the case described by Drs. Pringle, Dockeray, and Mitchell (*Journal*, February 10) the first sign of danger was "the blood count revealed under 200 white cells with a complete agranulocytosis." As agranulocytes normally number over 2,000 the count revealed not only serious agranulopenia but grave leucopenia. It may be difficult to foresee the onset of this condition, but we have a better chance in

pneumonia than in some other diseases. Moreover, it is generally a frank sulphanilamide poisoning.

In a smart attack of pneumonia, about forty-eight hours after the rigor, the count was 20,000 white cells, of which 90 per cent. were neutrophils and 10 per cent. mononuclears. Eosinophils having vanished as usual, the defence depended on pure neutrophilia. Now in estimating the response we must remember that normally (1) the life of the circulating neutrophil lasts for about three days; (2) in every hundred there are about one dozen marrow forms (unsegmented nucleus), seven dozen polymorphs, and four multinuclears (five or more nuclear lobes); and (3) none of these shows iodophilia. Further, in twenty-four hours after the initial rigor we confidently expect multinuclears to disappear; unsegmented forms to double, treble, or even to outnumber polymorphs; and every neutrophil to show marked iodophilia, which is evidence of increased biochemical activity. In the course of a smart attack neutrophils probably die younger, but even in grave toxaemic attacks with leucopenia marrow forms predominate and iodophilia may be intense. If all is well iodophilia disappears in twenty-four to forty-eight hours after the crisis, but smouldering remains of infection, like empyema, may keep it up, though leucocytosis may have greatly subsided. Except in mild attacks, a few myelocytes are to be expected and included among marrow forms. This rational grouping of neutrophils makes the count easy and practically useful.

At the beginning of treatment there should be a count, and the differential should show the grouping of the neutrophils in order to control the dosage afterwards. Thereafter films every second day would usually be sufficient to show approximately the leucocytosis and its grouping. If a drug damages the circulating leucocytes one expects greater injury to the highly specialized neutrophils than to the robust mononuclears. Evidence would probably first appear as general decline of biochemical activity, with iodophilia falling from intense to diffuse discoloration and disappearance. Accompanying this would be high mortality of polymorphs with unusually high percentage (over 50) of marrow forms, and the white count would soon fall conspicuously unless the bone marrow showed still greater activity, which in the circumstances would be very unlikely. Mononuclears would probably be little affected till cellular poisoning extended to the mucous membrane and lymphoid tissue of the tonsils, and by this time the bone marrow also.—I am, etc.,

London, W.13, Feb. 13. ROBERT CRAIK, M.D.

Treatment of Varicose Ulcer

SIR,—One cannot help being impressed by the regularity with which bombardments directed against the several methods of dealing with varicose ulcers re-echo through your correspondence columns. I must admit having contributed to the barrage during 1930, when I described in the *Journal* "a new paste-bandage for use in varicose ulceration and phlebitis." Since then I have relied almost entirely upon this "cellanband" dressing, as it is now termed, and, although remaining silent, I have kept careful records.

Experienced observers learn to differentiate, from the point of view of prognosis, three groups of ulcers. Everyone knows that the shallow acute ulcer which appears on a limb knotted with superficial varices and yet maintaining an unimpaired deep venous blood flow is a joy to deal with, however large its surface area. The careful application of any variety of firm supporting bandage combined with a number of sclerosing injections will usually ensure healing within a few weeks. On the other hand, the really impossible ulcer is one which develops in "iron-hard" rather than in oedematous, pitting tissues. As a result of recurrent attacks of phlebitis and lymphangitis drainage is permanently reduced to a minimum, and, even when the limb has been kept elevated and sheathed in elastoplast for weeks, swelling persists and skin resilience is not restored. As one ulcer reduces in size a second forms, until one realizes the absurdity of attempting to stem the escape of tissue fluids at one point or another.

Between these pleasant and well-nigh hopeless varieties there exists a large group of ulcers which respond—albeit reluctantly—to conscientious treatment and which remain healed so long as the patient takes proper precautions. A considerable measure of success attends widely differing ways of dealing with this group, and not unnaturally each technique has its own champion who will defend it against all comers. The only excuse I have for breaking a silence of ten years' duration is to say something in favour of my own method, which has been mentioned in recent letters.

In private practice failures have been exceptional, but since I apply every dressing myself, and because domestic circumstances are usually very favourable, I have always thought it unfair to include these results in any statistical review. The cases I have dealt with at Swansea Hospital and in three smaller institutions since 1929 number 515, of which 397 were in females and 118 in males. In recent years the volume of hospital patients has been much reduced owing to the renewed enthusiasm shown by practitioners since the present successful methods of treatment came into vogue. My records indicate that 89 per cent. of all non-syphilitic ulcers treated in true ambulatory fashion have healed soundly after periods varying between three weeks and twelve months. Recurrent ulceration has not infrequently arisen, due largely to neglect, to fresh attacks of phlebitis, and to trauma. Nine per cent. of the ulcers have failed to respond to cellanband dressings applied over very long periods. Yet when the patients have been persuaded to lie in bed with their legs elevated healing has occurred with annoying rapidity. The faces of the remaining 2 per cent. have by now become depressingly familiar. After years of unsuccessful treatment—including rest, cellanband, elastoplast, and even skin-grafting—one is tempted to regard their ulcers as incurable and to condone their preference for "elasto" and "the Manchester hospital for bad legs."

I have no doubt that other observers will at first consider these results most unsatisfactory, yet if they will closely analyse a sufficient number of cases they may find that the percentages do not vary materially with any efficient technique. The more I see of varicose ulcers the more I realize that successful ambulatory treatment is not merely a matter of providing an efficient elastic support and allowing the ulcer to "stew in its own juice." In some cases the above measure may prove just as successful as Trueta's closed treatment of compound fractures or the Winnett-Orr technique in osteomyelitis. Very often, however, pooling of discharge under adhesive plaster leads to maceration of the skin, extensive dermatitis, and steady increase in the size of the ulcer. In this connexion I heartily endorse the observations made by Drs. S. Watson Smith, J. R. A. Davies, and F. A. E. Silcock.

My main reason for continuing to use cellanband dressings is that they permit me to deal with each leg according to its own peculiarities. If the wound is intensely painful it can be dressed beneath the bandage with an analgesic ointment such as "nestosyl." If there are eczematous areas they may be lightly coated with ether-soluble tar paste. There is nothing to prevent me from testing the usefulness of any direct application such as cod-liver oil, tannic acid, silver nitrate spray, or a hundred and one other recommended media, whilst still maintaining adequate compression-support. Patients who change from adhesive plaster to paste-bandages invariably comment upon the increased comfort of the latter and upon the absence of pruritus. Moreover, since the paste-bandage never adheres closely to hair or skin they are impressed by the simplicity and painlessness of its removal.

I admit that my method has three disadvantages. The first is the moist sticky nature of the bandage. The second is that dressings must usually be undertaken more frequently than when elastoplast is used. The third concerns the tiny proportion of phenol which is necessarily included in the cellanband paste formula to prevent the growth of moulds. Very occasionally the skin of a susceptible patient reacts to this antiseptic and an irritating rash arises. In the latter connexion, however, it should be noted that the bandages are not difficult to manufacture in hospital, and for special cases they can be freshly prepared without the addition of any preservative.

In conclusion I would offer these few words of advice to the practitioner who has no pet theory to defend. Never

adhere blindly to one method of treatment. Study the idiosyncrasies of a difficult ulcer as if they were those of a living individual. If one technique disappoints, try another; and if all else fails, remember that the oldest method of treatment —that of strict confinement to bed—still secures healing in the shortest space of time.—I am, etc.,

Swansea, Feb. 15. C. J. CELLAN-JONES.

Obstetric Shock

SIR,—In the course of fifty years and an experience of over 5,000 cases of midwifery I have seen three cases which for want of a more exact diagnosis I would classify as shock. All three were in nervous women and all recovered.

The first patient was a multipara, and appeared to me to be going to die undelivered. I quickly applied forceps—with or without chloroform I do not remember—and delivered her. She had had many family worries, but she quickly recovered. The second case occurred after normal delivery of the placenta. The symptoms suggested a concealed haemorrhage, but there was none. The third case was exactly like the second, but occurred in my son's practice. He was very much alarmed and sent for me. There was no concealed haemorrhage and no other pathological condition to account for the collapse.

I do not think that there was any "suppressed fear of death" in any of my cases, as suggested by Dr. Violet Russell (*Journal*, February 10, p. 232). I lost one patient from puerperal fever who had cried herself to sleep for two months, but I ascribed her death to infection from a child who was desquamating from scarlet fever and who was running in and out of the house.—I am, etc.,

Erdington, Birmingham, Feb. 11. R. ANDERSON.

Tuberculous Laryngitis

SIR,—I have read Mr. R. Scott Stevenson and Dr. F. R. G. Heaf's instructive article on tuberculous laryngitis (February 3, p. 164) with great interest, and have made a note of their use of chaulmoogra oil, which I propose to try in the near future. I think it worth while, however, calling attention to the value in this condition of 5 to 10 per cent. menthol in olive oil,[1] which during phonation is dropped on to the cords from a laryngeal syringe in a manner similar to that described for chaulmoogra oil. The menthol acts as a decongestive and anaesthetic, and is particularly useful in the simpler non-ulcerative forms of tuberculous laryngitis, but is well worth trying in all cases, and has been used at this sanatorium for the past eighteen months. Patients, after the first one or two applications, appreciate the relief it gives and welcome its use.

I note also that of the authors' forty cases treated by ultra-violet light ten were definitely worse after treatment. I have found that the use of this method requires some care to avoid excessive reaction, and do not exceed thirty seconds at each session, with an inspection of the larynx three or four days later before proceeding to the next application.

Valuable as these accessory methods of treatment are, I think it will be agreed that the maintenance of absolute silence still remains the most efficient treatment of this sinister and often painful complication of phthisis.—I am, etc.,

Black Notley Sanatorium, Braintree, Feb. 7. R. C. COHEN, M.D., D.P.H.

SIR,—In the interesting and instructive article by Dr. Scott Stevenson and Dr. Heaf which appeared in your issue of February 3 no mention is made of ionization for the relief of dysphagia. Such excellent results have been obtained by this method, which is simple and does not distress even the extremely ill patient, that I again call attention to it. It was first described by Grain (*Tubercle*, 1936) and later by myself (*Lancet*, 1938), when I stated that seven out of eleven patients obtained complete relief from this most distressing symptom. Since then the method has been tried with equal success on a larger number of cases both at this and other places visited by our consulting laryngologist, Mr. J. McGibbon, with equally gratifying results. I am unfortunately unable to quote exact figures as both Mr. McGibbon and myself are away from our sources of information.

[1] *Dtsch. Tuber.-bl.*, July, 1938, **7**.

The statement that "the distressing symptom of dysphagia rarely occurs in tuberculous patients when adequate attention to the larynx is given" seems unduly optimistic to me. I shall be surprised if the authors' opinion is shared by others with much sanatorium experience.—I am, etc.,

Liverpool, Feb. 14. V. COTTON-CORNWALL.

Ambulant Treatment of Peptic Ulcers

SIR,—There is an element of some danger to the welfare of patients with chronic peptic ulcer in the acceptance of the ambulant treatment described by Dr. David Ferriman in your issue of February 10 (p. 210). One of the major problems in these cases is the tendency of so many to give themselves ambulant treatment on their own diagnosis of indigestion, and the recommendation of a newspaper advertisement to take some patent remedy as a certain cure, until months or years after the probable beginning of ulceration. It cannot be too clearly stressed that the three cardinal desiderata of medical treatment in peptic ulcer are: (1) early and correct diagnosis; (2) adequate treatment; (3) advice as to the future regulation of the patient's life. In most cases (1) and (2) will effect cure, and (3) usually varies in stringency with the efficiency of (1) and (2).

When, with adequate treatment, the majority of peptic ulcers are radiographically healed in about two months and gastroscopically healed in another month or less, to accept as failures only those in which little or no healing is visible at the end of a year is to set a dangerous standard for cure by any method, ambulant or otherwise. Chronic ulcers can probably heal in this time with no treatment at all.

Scarcity of beds, be it peace time or war time, should never justify the taking of liberties with cases of peptic ulcer, and they should always be regarded as deserving adequate care. Even in peace time there is a lamentable tendency for them to be discharged too soon from both in-patient and out-patient care because they are a common type of malady, devoid of interest to many clinicians and of meagre value as clinical material in teaching hospitals.—I am, etc.,

London, W.1, Feb. 13. J. C. HAWKSLEY.

Plea for the Metric System

SIR,—I agree with Dr. M. E. Lampard (*Journal*, January 6, p. 36) and Mr. E. G. Turner (February 10, p. 233) that the metric system offers many advantages over the imperial, and its introduction is a desirable aim, but in my opinion the sudden disuse of the latter would create more confusion than it would dispel. The question of adaptation to the metric measures would not be so simple in actual practice. A real difficulty is presented by the fact that medicine bottles are graduated according to the imperial system. The logic of the patient has to be reckoned with. Has Dr. Lampard ever reasoned with a patient who received a bottle not quite full? From the pupil's point of view a sudden reform would be equally confusing. It would be a handicap rather than an advantage to the student to graduate with a knowledge of only the metric system. A knowledge of both systems is not a cumbersome burden to carry, and it equips the student for dealing with the situation as it is at present and also such changes as may develop in the future.

The adequacy of the metric system for the needs of doctor and pharmacist alike cannot be denied. It must be asserted, however, that the reform must be gradual. The first steps were taken when the *British Pharmacopoeia* recommended the discontinuance of the use of the symbols for drachms and ounces. Incidentally, it is to be noted that Dr. Lampard has not adopted the official recommendation of millilitre.—I am, etc.,

Department of Pharmacology, Sheffield University, Feb. 16. ANDREW WILSON.

SIR,—It seems that wars are responsible for many great reforms, and if the general adoption of the metric system, not only in medicine but for all types of measurement and assessment, emerges from this one it will be something accomplished.

It has often appeared to me strange that a patient should imbibe fluids by the mouth in ounces, by the rectum in pints, and intravenously in cubic centimetres; or that blood, when delivered rapidly, enters by the pint, while if it drips in more slowly should pass in cubic centimetres. Again, although urine is commonly voided on hospital charts in arabic ounces, measurements of sputum and vomit seem to be favoured with the distinction of roman numerals, though also in ounces.

It is interesting to observe in the *Pharmacopoeia* of my own hospital that quantities are recorded in both the metric and the apothecaries' measures, and that the metric system comes first. It is also advised (in bold type) in the introduction that roman numerals should not be employed, nor the symbols ʒ and ʒ, and these are steps in the right direction. But few people take any notice of these injunctions, or indeed know of their existence, any more than they know why they start their prescriptions with the mystic sign ℞.—I am, etc.,

Hill End Hospital, St. Albans, Feb. 16. MICHAEL HARMER.

Obituary

H. CAMPBELL THOMSON, M.D., F.R.C.P.

Herbert Campbell Thomson died at his home near Dulverton on February 11 in his seventieth year after a long illness, which he bore with great fortitude. He entered the Middlesex Hospital as a student in 1888, and later gained the Broderip Scholarship. After holding various house appointments he became medical registrar at Middlesex Hospital. He held the position of pathologist and curator of the museum from 1899 to 1903. In 1897 he was elected to the staff of the Hospital for Epilepsy and Paralysis, Maida Vale, which he served with devotion till his retirement. Having received a sound training in general medicine and pathology he was appointed assistant physician to Middlesex Hospital in 1900. Though an able physician in general medicine his main interest was directed towards neurology, and he soon felt the necessity for the creation of a separate department for this specialty. This view received the approval of the Board, so that in 1908 he was made physician-in-charge of the Department for Nervous Diseases. This department, one of the earliest in any London teaching hospital, was appreciated by successive generations of students, who were thus given instruction in a difficult subject by a teacher who excelled in presenting clinical facts in a simple manner. His textbook *Diseases of the Nervous System* had, and still has, a wide popularity. Although he made a number of original contributions to his subject, he had little time left for research work owing to his long tenure of the post of Dean, which lasted from 1908 to 1919. During the war his task was a difficult one. The greater part of the medical and surgical staff was employed on military service of some kind, which made teaching arrangements far from easy. Added to this was a falling off in the number of students with its attendant financial anxiety. Campbell Thomson tackled these and other problems with his characteristic tenacity. To the student he was both a friend and wise counsellor, taking a keen personal interest in his activities, academic as well as athletic. Subsequent deans were grateful to him for his friendly advice, which he was always so ready to give. During these years his practice, both hospital and private, was not confined to organic neurology but also included the neuroses; in the treatment of the neurotic patient he was especially successful owing to his insight into human nature, his kindliness and patience. He took an important part in the negotiations with St. Luke's Hospital for Mental Diseases by which, in 1923, this hospital agreed to support six beds in the Middlesex for the treatment of early border-line cases, under the care of one of their physicians.

Campbell Thomson never enjoyed robust health, and in 1924, much to the regret of his colleagues, he was compelled to give up both hospital and private practice. No account of his life would be complete without mention of his interest in games, more especially in Rugby football. As a student he played for the hospital for several seasons. In later years he was usually to be seen on the touch-line on a Saturday afternoon cheering on his hospital. After his retirement he always found an excuse to visit Twickenham. In 1938, after a serious illness and while still under treatment in the Woolavington Wing, against medical orders he insisted on seeing the hospital play their cup-tie. On his retirement to his cottage near Dulverton he found much to interest him, being a keen fisherman and lover of birds. Within walking distance of his cottage lived Fred Goss, formerly stag harbourer to the Devon and Somerset Foxhounds. Campbell Thomson spent many winter evenings listening to his stories. These he transcribed and published in 1931 under *Memories of a Stag Harbourer*, by Fred Goss. The writing of this book, which now ranks amongst the classics of this sport, gave him great pleasure. In 1933, at the invitation of the Council of the Middlesex Hospital, he agreed to write a history of the medical school to commemorate its centenary in 1935. He undertook this difficult task with his usual energy. Happily for him this work necessitated the spending of much time at his old hospital. This book has proved a most valuable link between Middlesex men and their old school. Of no member of the staff can it more truly be said that the hospital and school were the centre of his life's interest and work. He was endeared to his friends by his modesty, generosity, and kindliness. Many old Middlesex men, when they look back on their alma mater, will find their thoughts turning to Campbell Thomson with affection and gratitude.

Dr. H. Campbell Thomson was vice-president of the Section of Neurology and Psychological Medicine at the Annual Meeting of the British Medical Association held at Aberdeen in 1914, and his younger brother, Dr. F. G. Thomson of Bath, was President of the Association in 1925–6.

Sir ALFRED WEBB-JOHNSON writes:

All connected with the Middlesex Hospital are mourning the loss of Dr. Campbell Thomson. Their sorrow at his death is mitigated by their gratitude for his services to the Middlesex Hospital and Medical School, and for his friendship and help which he gave so readily to all who shared his affection for his alma mater and were willing to work for its achievement. Devoted loyalty was Campbell Thomson's outstanding characteristic, and he combined with it a lovable personality and an innate modesty. He would work to the point of exhaustion for a cause he had at heart, but for his own advancement or any recognition of his self-sacrifice he cared not at all. His personal ambition, in the war years particularly, seems to have been entirely submerged in his great absorption in the service of his country and his hospital.

Campbell Thomson was a neurologist of great distinction. The foundations of his reputation in his own specialty were well and truly laid in a long study and experience of pathology, and several years' service on the staff of the hospital as a general physician. In many ways Campbell Thomson was a pioneer. He was the first to make use of the cinematograph as a medium for clinical teaching. He used it with greatest success for demonstrating the abnormalities of movement and gait peculiar to various nervous diseases. He was also a pioneer in industrial medicine. By arrangement with his friend the

late Sir Henry Royce he made periodic visits to the Rolls-Royce works at Derby, when any of the employees could seek an interview. Many cases of illness were cut short and prevented by kindly medical examination.

To his colleagues he gave readily of his time and energy in helping them in their researches and writings. For his students no effort was too great, and many, from all parts of the Empire—particularly New Zealand—will remember with gratitude the help they received from him. He held the office of Dean of the Medical School for eleven years, a period which included the war years. He carried on all his regular work as physician and Dean, and, in addition, gave his services gratuitously for the care of the sick and wounded soldiers, attending regularly at Queen Alexandra's Hospital at Millbank, in spite of the great strain on his delicate frame. His last great service to his medical school—at great expenditure of his time, energy, and money—was the writing of the *Story of the First Hundred Years*; the book was very favourably received. Campbell Thomson's life and work have been to Middlesex Hospital an inspiring example.

SIR WILLIAM HODGSON, L.R.C.P.I.

The following account of the life of Sir William Hodgson, who died on February 10, is extracted from a full memoir written by his friend Dr. Lionel J. Picton.

William Hodgson was born in 1854, the fifth child of a farmer. When he was 5 his father, joining a family business, migrated with his family to America. After the lad had been two years at school at Chicago the family returned to Birkenhead. After school days at the Liverpool Institute, he was apprenticed to a chemist, but six months later entered St. Thomas's Hospital. The great Barnes was then in the ascendant, and Hodgson's undoubted skill as an accoucheur had its roots in that association. He seems to have declined an opportunity to continue as Barnes's assistant, suspecting perhaps that his star was waning. No doubt Barnes was an influence on his life: the great man wrote of the superiority of general practice over specialism. After six months in the Glasgow hospital—Lister was there at the time—Hodgson completed his medical education in Edinburgh and Dublin, qualifying in 1876 as L.R.C.P.I. and L.M.; in 1880 he became L.R.F.P.S. of Glasgow. He spoke, too, with some chagrin of a degree of M.D. he took in Dublin, for the degree-giving authority (as the result, he said, of a lawsuit with Trinity College) lost its right to confer degrees. He then bought Dr. Lord's practice in Crewe, because he wished to be near his mother in Birkenhead. At once he entered public life, standing as a Liberal for East Ward. Unsuccessful then, he won the West Ward in 1881 and served for fifteen years. Mr. Webb, the inventor of the three-cylinder compound locomotive, was also on the council, and being in control of some 15,000 railwaymen not only was virtually dictator of Crewe but was apt to sack men tainted with advanced politics. Hodgson with his passion for freedom was inflamed by this; and the council was the theatre of war. Hodgson and his friends found work for some of the dismissed men, and the conflict excited widespread comment. The intimidation ceased, and therewith disturbance and disaffection. Freedom of political conscience was secured for Crewe works.

Dr. Hodgson rode a cob on his county rounds; he played a grand game of tennis, and for years was a vice-president of the English Lawn Tennis Association. He played cricket for Crewe; he had a passion for pike-fishing; his mellow tenor was in request for oratorios; he was a local preacher. As first chairman of the Crewe public health committee he was concerned in the first appointment of an M.O.H. and in the erection of an isolation hospital—on a small farm on the outskirts. His was a very personal responsibility. When a small-pox patient in delirium escaped, Dr. Hodgson, called up in the small hours, gave chase and rounded up the quarry in a cornfield. The man died of pneumonia and Dr. Hodgson took the small-pox. During his convalescence the Crewe band played below his window. A war against "slink" meat was his next campaign; and then the newly formed county council claimed him. His death removes the last survivor of the original members. His interests radiated widely from Crewe; the M.P. for the division, Mr. MacLaren, nephew of John Bright, was his frequent guest. The doctor, even while building up an enormous practice, threw himself into politics; for two years he wrote the political notes for the *Crewe Chronicle*. In 1892 he was Mayor of Crewe. In that year the technical instruction committee was formed and the mayor was the leading spirit. Then "Education" began to preoccupy him. He qualified for the vice-chairmanship of the County Education Committee on its formation in 1903 by studying the educational systems of Europe and America in protracted and adventurous holidays. He became chairman in 1907, resigning only when, fifteen years later, he became chairman of the county council. During that fifteen years the whole of the present fabric of county education received, largely at his hands, its shape. A justice of the peace for the borough and also for the county, he was for twenty-seven years chairman of the licensing justices of the borough. "He seems never to have shirked the public work that flowed to him amidst preoccupations with his large practice that would have more than sufficed for the energies of most men. But the warp and weft of his life kept the pattern clear for all its complexity. He had the capacity to open his mind upon one problem, to engulf it, digest it, select its essence. So much came to him to be done, and he did it well—and unflinchingly." Too much so for his peace. The Crewe justices originated "the Crewe agreement," and the battle in one form or another went on for a quarter of a century. From 1893 to 1922 Dr. Hodgson was chairman of the County Mental Hospital at Upton, 1,500 beds, 249 nurses. His ambition was to turn it from a place of care to a place of cure. The present fine laboratory is an evidence of that effort. The theatre, the good housing of the nurses, the T.T. herd of cattle, the hospital as well as lunacy training for the nurses, the study leave for the staff—all come from his initiative or advocacy. He was one of the founders and became chairman of the Mental Hospitals Association. When the National Health Insurance Bill was under way Dr. Hodgson was "sounded" in connexion with the Commission that was to govern the scheme—but he preferred to stay where he was rooted. Till 1915 he was treasurer of the Cheshire Panel Committee. He was chairman of the Drug Committee, and from 1919 vice-chairman of the Panel Committee. Ten years later he became chairman. Throughout these years the status and liberty of the practitioner were his preoccupation. "It was not in the interests of the public themselves that the scope, influence, and responsibilities of the general practitioners should be diminished or weakened. Such circulars as that of the L.G.B. suggesting as it did that only selected practitioners were fit to isolate a vein and inject salvarsan pointed to the low estimate held in official circles of the competence of the ordinary doctor. Aforetime the ordinary barber hung out his pole and was able to open the median basilic vein . . ."—no mere academic opinions these, but the Commissioners were told by the committee that "the regulations would arrest the sympathies and jettison the services of those G.P.s who, both singly and in co-operation, have fitted themselves by years of labour to carry out the higher and special forms of medical work. . . ." The Commissioners thereupon invited a deputation, and on October 26, 1916, Dr. Hodgson and two others went up, to be received by Sir Robert Morant and Mr. Vivian—"Upwards of four hours of close and fierce but amicable discussion," said Dr. Hodgson. The Panel Committee, in the upshot, were invited to draw up a treatment scheme, which was agreed in its detail finally in 1918 and the G.P.s were provided with arsenobenzol compounds by the County Council.

From 1917 onwards year by year a motion by the Cheshire Panel Committee came before the Panel Conference urging that when a practitioner is dissatisfied with a decision of the Commissioners he should have the right of appeal to a court of law. Hodgson first sponsored this Cheshire motion. At the 1924 Conference he cried, "We are the only body of men shut out from such a privilege." The motion was accepted

in principle, referred to the Insurance Acts Committee, and so has stayed. On November 18, 1917, Dr. Hodgson's resignation from the panel with 169 others from Cheshire was handed to the clerk. The Panel Conference in October had decided that 10s. capitation should be demanded instead of the 7s. then obtaining, and ordained that the profession should be organized therefor. Sir Robert Morant inspected the map of Cheshire. Red spots showed the doctors who had not resigned, black spots those who had. There were too many black! He dictated a letter arranging a *modus vivendi*. Under it Dr. Hodgson and the rest served their patients and were paid, but without any agreement at all. This isolated action undoubtedly convinced the authorities of the temper of the panel and helped to secure the eventual rise.

Sir William, as he became in 1927, was for some years a member of the Cheshire Insurance Committee and medical service subcommittee. In 1918 he was elected on the I.A.C. by the Cheshire, Shropshire, and North Wales group. Next year turbulent Cheshire was visited by authority. Dr. Smith Whitaker, Dr. Cox, and Dr. Meredith Richards came to the Chester Town Hall and held a conference. Dr. Richards spoke with charm, Dr. Cox with blunt sanity, and was freely interrupted by Dr. Hodgson. Then Dr. Smith Whitaker levered himself up, and with his spell of logical exposition began to commend a body of unacceptable regulations—began only, for Hodgson sprang in. His intervention was volcanic. The Welshmen present who had listened to the voice of Richards stormed back: Hodgson dominated them, made them hear his telling reasons for rejecting all that the persons in high places put forth. The meeting ended with the Welshmen warmly shaking Dr. Hodgson by the hand, voluble in their congratulation. But he was not against the Act, which, as he remarked only two months after that incident, "has enormously increased the ease with which a doctor can conduct his practice." His later share in public work, in the Rease Heath Agricultural School and in the Cheshire joint sanatorium, for instance, followed as a matter of course from the mastery he had gained in county affairs. In the year of his knighthood he received the freedom of Crewe; the Marquess of Crewe and he were for some years the only living burgesses. The crown of his career was when he received the Prince of Wales at the opening of Rease Heath in October, 1926.

On his eightieth birthday the Panel Committee presented him with a *Fasciculus Cestriensis*, a book published in his honour. Besides a biography of himself it contained medical papers by fifty Cheshire doctors specially written. It was a volume of some 300 pages, and 600 copies were distributed, one to each Cheshire doctor.

J. H. CONYERS

Late Surgeon-General, British Guiana

By the death of Dr. James Hill Conyers at Hove on February 4 (writes K. S. W.) there passed away one of the most distinguished and beloved members of the medical service of British Guiana. Few lives can have been more completely devoted to the service of his fellow people and few have commanded in an equal degree their full respect and complete confidence.

He was born in British Guiana in 1864, and his early education was passed in the schools of that Colony. He soon showed that ability and skill which was to characterize his work throughout life, and he won at the age of 18 that greatly prized distinction, the Colony Scholarship. He went to Edinburgh to take up training for the medical profession and secured medals for chemistry and physiology. In 1889 he was awarded the surgical prize of the Extramural School and obtained the degree of M.B., C.M. of the university. Doubtless influenced by the land of his birth, he decided to enter the Colonial Medical Service, and was thereupon detailed to the Gold Coast as a Government medical officer. From there in 1892 he transferred to British Guiana, and was associated in his early years with such men as Sir David Palmer Ross, the administrator, and Dr. C. W. Daniels and Dr. A. T. Ozzard, research workers. Surgery, however, had been his early interest, and as an operating surgeon he continued his career and in 1908 was appointed assistant resident surgeon at the principal hospital. His skill and judgment in surgical treatment and his courtesy and kind, considerate manner soon brought him promotion, and in 1912 he took over the charge of the New Amsterdam Hospital. His administrative qualities were soon evident, and his reconstruction of the different departments of this hospital being completed in an eminently satisfactory manner, he was called to take charge of the principal hospital in Georgetown. In 1919, when the Surgeon-General of British Guiana was promoted to Trinidad, Dr. J. H. Conyers was recognized as the most suitable officer to fill the vacant position, and thus he reached the culminating point of his career by holding the principal administrative position in the medical service of the Colony. In 1921 failing health necessitated his retirement, to the universal regret of all classes of the community. Thereafter he lived in England, first at Margate, then in London, and lately at Hove.

To those who knew Dr. Conyers intimately he will be chiefly remembered not so much on account of the valuable work he accomplished during a long and active life as on account of what he was. He was a man of absolute integrity of character, unable to do an unkind, selfish, or unworthy action; a fine gentleman of a disappearing generation, imbued through and through with a kindly courtesy and an innate consideration for all people from the highest to the lowest. He leaves a widow, a son in the medical profession, and a married daughter.

A well-known Midland laryngologist, Dr. WILFRID GLEGG, honorary consulting surgeon to Birmingham Ear and Throat Hospital, died on February 4. Dr. Glegg was born in Edinburgh in 1873, and received his education at George Watson's College and Edinburgh University. He took his M.B., C.M. in 1895 and proceeded to the M.D. of Edinburgh three years later. In 1900 he became a member of the Royal College of Physicians of Edinburgh. Early in his medical career his interests turned to laryngology, and one of his first appointments was as clinical assistant in the ear and throat department of the Edinburgh Royal Infirmary. He also held a resident post at the Golden Square Throat, Nose and Ear Hospital, London. It was in Birmingham, however, that he settled and built up his reputation. He was appointed surgeon to the Birmingham and Midland Ear and Throat Hospital, and held various other appointments in the Midland city, including that of surgeon to the adenoid and tonsil clinic of the Birmingham Education Committee and honorary consultant to the Birmingham Deaf and Dumb Institute. Dr. Glegg was a member of the Section of Laryngology of the Royal Society of Medicine, and at the Birmingham Meeting of the British Medical Association in 1911 he was honorary secretary of the Section of Laryngology, Otology, and Rhinology. He published several papers on the subject of his specialty. Recently Dr. Glegg had been living in retirement in Surrey, and his death at the age of 66 was preceded by a long illness borne with fortitude. His many friends in Birmingham and elsewhere will much regret the loss of one who combined great skill in his profession with an intense earnestness of endeavour for the good of his fellows.

By the death of Dr. GEORGE CAMPBELL GARRATT on February 8 the City of Chichester and the neighbourhood for miles around have lost a great and valued physician. He went to Chichester in 1905 in succession to the late Dr. Harlock, who died after a few days' illness. Dr. Garratt graduated B.A. at Cambridge University in the Natural Sciences Tripos and, proceeding to St. Bartholomew's Hospital, had a most distinguished career, winning the Kirkes scholarship and gold medal at that great medical school. He took his medical degrees at Cambridge in 1893 and proceeded to the M.D. in 1903. He had been house-physician at Bart's and at the Royal Hospital for Diseases of the Chest, after which he was for some five years a medical officer of the London Fever Hospital, where he did most valuable original work in the treatment of diphtheria. With a colleague having this record, the medical men of West Sussex soon learnt that they had among them an unusually good and sound physician especially on chest diseases, and in consequence they were in

the habit of asking him to see their patients in consultation. Dr. Garratt was the first visiting physician to Aldingbourne Sanatorium and also to Graylingwell Hospital. In 1910 he was elected physician to the Royal West Sussex Hospital, which position he held until a breakdown in his health caused him to resign in 1931, when he was elected consulting physician to the hospital and retired from active practice. Dr. Garratt's kindness to his patients, especially the poor, gained for him a reputation any doctor might well be proud of. Nothing was too much trouble to him in his work; his patients received the very best he was able to give them, and with all that great work he was extremely modest. Dr. Garratt was awarded the O.B.E. for his services in the last war. He was chairman of the Chichester and Worthing Division of the British Medical Association in 1922–4 and president of the Sussex Branch in 1927–8.

Dr. JOHN FREDERICK HODGSON died recently at his home at Halifax, where he had practised for many years, aged 65. He was born at Keighley in Yorkshire, the son of a Halifax dental surgeon, and studied medicine at Owens College, Manchester, and qualified M.B., Ch.B. in 1900, proceeding to take the M.D. of Victoria University three years later, also the D.P.H. For a short time he was house-surgeon at the Oldham Royal Infirmary, and then returned to the town of his boyhood, where he was the first appointed resident medical officer to the newly opened St. Luke's Hospital, Halifax. Afterwards he became assistant medical officer of health to the town, in which capacity he did some excellent work, especially in connexion with an outbreak of arsenical poisoning among beer drinkers and in two epidemics of small-pox. In 1913 he was elected to the staff of the Royal Halifax Infirmary as honorary surgeon, and during the war he was medical officer in charge of the wounded admitted to that institution and surgical specialist to the Ministry of Pensions. Later he had charge of the venereal diseases clinic at the infirmary. He retired from the staff in 1934 on reaching the age of 60 and was appointed honorary consulting surgeon, and continued as far as his rather uncertain health allowed to take an active interest in the institution. With all this he carried on a large private practice and was extremely popular with his patients, who highly esteemed him as a sympathetic and understanding doctor and a skilful surgeon. In 1932 he underwent a serious operation, but recovered sufficiently to resume his practice. In 1936 he again became ill, and during the last few years he carried on his work in the face of great physical weakness. Dr. Hodgson was elected to the British Medical Association in 1907, and served for many years as honorary secretary of the Halifax Division. The assembly at his funeral service showed the high regard in which he was held by all sections of the community.

The death took place on February 1 of Dr. ARTHUR ALEXANDER JOSEPH MCNABB, who had practised at Alford and Mablethorpe for many years. Dr. McNabb graduated M.B., B.S. at Durham in 1892 and took the D.P.H. in 1904. He held various public appointments, being medical officer of health to the Mablethorpe and Sutton Urban District Council, district medical officer and public vaccinator to the Withern district of Louth, and a member of the staff of the Alford Memorial Hospital. In his earlier life, after a resident appointment at South Shields, he had been a surgeon in the Royal Navy. He was a Fellow of the Society of Medical Officers of Health and had been a member of the British Medical Association since 1904. In his district of North-East Lincolnshire he was highly esteemed.

Dr. JOHN JAMES EGERTON BIGGS, O.B.E., a well-known practitioner and public man in South Wales, died at Cheltenham on February 2. Dr. Biggs, who was 72 years of age, was born and educated at Cardiff, but went to London to receive his medical training at Guy's, qualifying in 1893. He afterwards returned to South Wales, where he held a number of appointments, including that of medical officer to the University College of South Wales and Monmouthshire. During the last war he held the rank of major in the R.A.M.C.(T.), and served in Gallipoli, Egypt, and Palestine, being mentioned in dispatches and receiving the O.B.E. (military). Returning to Cardiff he took a prominent part in the affairs of the city. He was made a justice of the peace, and he served as Lord Mayor in 1922–3. In the following year he was chairman of the Cardiff Division of the British Medical Association, of which he was a member for over thirty years.

Dr. JOHN ALFRED BARNES, for many years a well-known practitioner in Leicester, died recently at Worthing, where he had been living in retirement. Dr. Barnes was born sixty-three years ago in Shropshire, and received his education at St. Bees School, Cumberland. Then going on to St. Thomas's Hospital, London, he qualified in 1898. During the South African War he went out as a civil surgeon with the South African Field Force, and his services were recognized by the award of a medal and three clasps. From 1901 to 1905 he served as an officer in the Indian Medical Service. During the last war he was captain and medical officer in the 1st Batt. Leicestershire Regiment. He began his practice in Leicester in 1911, his special interest being ophthalmology, an interest dating from his early days, when he was ophthalmic house-surgeon at St. Thomas's. Among the profession in Leicester he came to occupy a position of considerable influence, and was elected president of the Leicester Medical Society. He was also prominently identified with the Leicester Public Medical Service. Dr. Barnes was a man of culture and of many interests outside his profession. One of these was meteorology and another photomicrography. He became a member of the British Medical Association on settling in Leicester, but he resigned at the time of the national insurance controversy, rejoining in 1919 and continuing in membership until his retirement four years ago. He is survived by a widow and by a son, who is following his father's profession.

We have received from India the following appreciation of the work and character of Dr. JAMES CAIRNS, whose death was recorded in the *Journal* of December 30 (p. 1298). He served with the R.A.M.C. during the European war from 1916 to 1919 in India, and received a mention in dispatches and the decoration of O.B.E. After the war he became lieutenant-colonel in the Auxiliary Force Medical Corps. In 1919 he accepted the appointment of assistant medical officer of health, Bombay, and in March, 1920, was appointed principal medical officer of health of the G.I.P. Railway, a post which he held till 1927, when he became the chief medical and health officer of the North-Western Railway with headquarters at Lahore. In both these appointments he distinguished himself by a complete reorganization of the health and sanitary services. He was instrumental in the construction of new hospitals and in the better equipment of those which already existed. On the occasion of the Quetta earthquake he was sent to Quetta in charge of the medical contingent which left Lahore fully equipped (thanks largely to his forethought and preparations for emergencies) within a few hours of the news of the disaster. For his brilliant work on this occasion he was granted the C.I.E. in 1936. Throughout his career Dr. Cairns took the liveliest interest in the work of the St. John Ambulance, and for many years was assistant commissioner for the whole of the north of India; not till 1939, when the expansion of work made it impossible for one busy man to handle the whole of it, did he relinquish a portion of his duties to two other assistant commissioners while retaining that rank for his work on the railway zone. Busy as he was in these public duties, nevertheless he found time to take a rich part in more intensive though restricted organizations. In all charitable circles he was a well-known figure, and his great gift of music was at the disposal of the choir of the Cathedral as well as the Scots Church. His circle of friends was very large and ever-growing, and his sudden death, accelerated by a period of strenuous work, was a great shock to the whole of the Punjab. He has left behind him the memory of a life spent in noble service, of a man on whom reliance was placed to the uttermost.

Medico-Legal

A DANGEROUS HAIR DYE

The question of when one man owes another a duty to take care is one of the widest in law. It cannot be answered by reciting a set of rules, but only by enumerating an almost innumerable series of decided cases. The famous "snail" case[1] laid down that a manufacturer of harmful goods may be liable to the consumer although the two parties have not come into any contact and no agreement has ever been made between them. A recent case heard by Mr. Justice Stable at Manchester Assizes[2] extended the duty to distributors of goods, and indicated circumstances in which legal liability may fall from an unexpected quarter. A gentleman used to have his hair dyed at the shop of a lady hairdresser, and never had cause to complain of her skill and care. One day she told him of a new dye known as "melereon," and showed him some advertisements of it. She said she had had no experience of its action and had not tested it. He agreed to its use, and contracted severe dermatitis. The dye consisted of a preparation of powder and a fixative lotion; the latter contained 10 per cent. of chromic acid instead of the 4 per cent. it should have contained. He did not suggest that the lady had been negligent. The dye was distributed by one firm and manufactured by another. The lotion and the powder were delivered separately to the distributors, and they packed them separately for the trade without applying any test. The percentage of chromic acid was never laid down between the manufacturers and the distributors. The advertisements issued extensively by the distributors declared that "melereon" could not harm the most sensitive skin and did not need any preliminary tests. In a brochure sent to the hairdresser the distributor repeated these claims. It was agreed that a lotion with a 10 per cent. solution of chromic acid is not part of a merchantable hair dye.

The customer sued the hairdresser, the distributors, and the manufacturers. The learned judge decided that he had a valid claim against the hairdresser, even though she did not recommend the dye and applied it carefully and scrupulously in accordance with the distributors' directions. He held that where the agreement is to pay partly for a service and partly for a supply of goods, there is an implied warranty that the goods shall be fit for the purpose for which they are intended. To succeed against the distributors, his Lordship said, the customer had to prove carelessness, the existence of a duty, and breach of that duty. He was satisfied that the distributors had been careless. They were dealing with a manufacturer they hardly knew, a refugee from Spain, and the stipulation for 4 per cent. of chromic acid was only verbal. They never tested the components of the dye in any way. Lastly, they described it as absolutely harmless and needing no test.

In discussing whether they owed a duty to the customer the judge held that the principle he ought to follow was that where a person intentionally excludes interference with the article or its examination by the consumer he brings himself into direct relationship with the consumer and is responsible for the consequences. It does not matter whether he is a manufacturer or a distributor: if he does this he owes the consumer a duty to take care. These distributors had put themselves in the position of being responsible for the customer's safety. Thirdly, although the initial mistake was made by the manufacturers, the negligence of the distributors did the damage, for they both neglected to apply tests and represented that their hair dye, unlike every other, was not dangerous. They knew that the thing they were putting on the market was in a dangerous class of things, and even 4 per cent. of chromic acid was dangerous to a considerable percentage of people. They therefore fell under the principle that a person who puts abroad a dangerous article must be unusually careful. This hair dye was unusually dangerous—like a wolf in sheep's clothing, or a sheep which the distributors had made as dangerous as a wolf. The distributors were therefore also liable to pay damages. The judge did not consider the claim against the manufacturers, because they had gone into liquidation and could not be found.

[1] M'Alister (or Donoghue) *v.* Stevenson, 1932 A.C. 562.
[2] Watson *v.* Buckley and others, 1940 1 All E.R.174.

Universities and Colleges

UNIVERSITY OF OXFORD

Edward George Tandy Liddell, D.M., F.R.S., Fellow of Trinity College, Oxford, has been appointed Waynflete Professor of Physiology from March 1, in succession to the late Professor John Mellanby.

UNIVERSITY OF CAMBRIDGE

The Marmaduke Shield Scholarship in Human Anatomy of the annual value of £100 has been awarded to George John Romanes, of Christ's College.

The M.D. Committee has approved B. S. Jones, M.B., B.Chir., for the degree of Doctor of Medicine, in absence.

Mademoiselle A. M. Goichon of the Catholic Institute of Paris will give three Forlong Fund Lectures in French on the Philosophy of Avicenna, in the Arts School, on March 4, 6, and 7 at 5 p.m.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

The Council announces the award of Kirk Duncanson Fellowships for Medical Research to Dr. Helen M. Russell and Dr. Robert A. Miller for the ensuing year.

The Services

ARMY BLOOD TRANSFUSION SERVICE

On February 14 Queen Mary visited the headquarters in England of the Army Blood Transfusion Service, which is housed in the Southmead Hospital, Bristol. The original experimental work for standardizing the equipment and apparatus and the methods of collecting, storing, preserving, and transporting the blood for this Service was carried out in the Bernhard Baron Laboratories of the Royal College of Surgeons of England, by permission of the President and Council, at the request of Lieut.-General Sir William MacArthur, Director-General A.M.S.

The organization consists of two sections, one in England for the collection, storing, and transport of blood, the other over-seas for distribution and administration of blood when transfusion is indicated. The whole organization is under the general administrative control of Major-General Marrian Perry, Director of Pathology at the War Office. Professor John Beattie, the Director of Research at the Royal College of Surgeons, who carried out the original work of standardization and organization, has been appointed Director of the Service with the rank of Colonel A.M.S. and put in charge of the oversea section. He has also been appointed Director of the Surgical Research Laboratories which have been established in France so that problems can be studied on the spot as they arise, and in order that new discoveries and new methods of treatment can be put at the disposal of medical officers in charge of the sick and wounded at the earliest possible moment.

The home headquarters of the Service is at Bristol, where Dr. L. E. H. Whitby, with the rank of Colonel A.M.S., is in command. He has three experts in blood transfusion working with him, all holding commissions in the R.A.M.C., five medical women, the first ever to be gazetted into the R.A.M.C., an officer of the R.E., N.C.O.s and men, V.A.D.s, and members of the A.T.S. The blood is collected from volunteer donors in the West of England and transported to

France by aeroplane as required. Many people have already given their blood eagerly, but many more are needed.

Queen Mary saw all the various activities of the home headquarters of the Service, the organization of which is without equal in the Army Medical Services of the world. Her Majesty was taken first to see the glass-blowing and mass production of apparatus and its assembling for use in France. The assembling is carried out by V.A.D.s and the glass-blowing by men. The methods of bottling, storing, and transport of blood and the special insulated boxes for use in aeroplanes were then demonstrated. Queen Mary was also shown the method of determining to which group the blood of a donor belonged, and thus ascertaining whether it is of the universal donor type which can be administered with safety to anyone. Her Majesty inspected the personnel and the special transport vehicles, including the refrigerator vans, and also greeted several of the blood donors and expressed her admiration and appreciation of their self-sacrifice. Each donor receives a card of thanks with the quotation from *Henry V*:

> "For he to-day that sheds his blood with me
> Shall be my brother."

Medical Notes in Parliament

A Treasury Minute issued on February 20 announces that the Votes for the War Services of the Ministry of Health and the Department of Health (Scotland) will be presented to Parliament in "token" form for nominal sums of £100 each. It is understood that Estimates for services unconnected with the war will be presented in detail.

A Further Evacuation Scheme

On February 15 Dr. ELLIOT said the Government remained convinced of the desirability of the dispersal of children from the evacuating areas. Plans had been prepared with the object both of retaining in the reception areas as many as possible of the 400,000 children still there and of providing for a further large-scale evacuation to take place if air raids developed on a scale involving serious and continuous bombing.

These plans for a new evacuation applied to school children only—not to adults. It will be for the Government to decide, in the light of prevailing circumstances, when these plans are to be put into operation and in respect of which areas action is to be taken. Evacuation would be voluntary. Parents who registered would be required to sign an undertaking that they would send their children away when evacuation was ordered, and intended to leave them in the reception areas until the school parties returned. Provision of sick bays and of hostels for difficult children and for those who are unsuitable for billeting in private houses and for other purposes would continue. Local authorities were being encouraged to make the best use of houses suitable for these purposes.

Dr. ELLIOT stated in the House of Commons last week in reply to Sir Ernest Graham-Little that the provisions for medical inspection of children before and after they were evacuated were set out in a circular and memorandum just issued to local authorities. The circular to which the Minister referred states that evacuation authorities have been informed that no child should be sent out who is suffering from infection or disease unless arrangements can be made for his care in an institution or other place until he is free from the infection. Children who are found on arrival to be suffering from scabies, impetigo, etc., should not be billeted on householders. To provide for such children hostels for about 5 per cent. of the total number of children expected should be set aside, empty houses being selected in the meantime for this purpose. Evacuation authorities should arrange for suitable helpers to accompany the children and staff these hostels. At the periodic school medical inspection special attention should be paid to children registered for evacuation. Once evacuation is announced the school medical service and nursing staff should concentrate on examining those who are to go. It may be necessary to continue the examinations after the children have reached the reception areas, in which case nursing and medical staff should accompany them and the receiving authorities should make all practicable arrangements for accommodating this staff and completing the examinations. Special attention is drawn in the circular to the need for ascertaining which children are subject to enuresis or other disability which would make them unsuitable for billeting on private householders.

Part-time Service in E.M.S.

Dr. ELLIOT told Sir Ernest Graham-Little on February 15 that consideration had been given to representations made by the Advisory Emergency Medical Service Committee in favour of extending the concession of part-time service in the Emergency Medical Service to the recipients of second-grade salaries on a parity with the terms offered to the higher-grade salaried officers in the same service—that is, with a remuneration of five-eighths of the full salary. The volume of work now falling on officers of the grade referred to was such that he was unable at present to make them the offer suggested.

Influenza

Answering an inquiry by Captain Plugge on February 15, Dr. ELLIOT said the number of cases of influenza was not exactly known, because the disease was not notifiable. The number of deaths ascribed to influenza in the great towns in England and Wales (which included over half the total population) gave some indication of the prevalence of the disease. The numbers of such deaths reported in the period of six weeks ended February 3, 1940, had been successively 46, 94, 158, 291, 416, and 350. These figures were higher than the normal figures for this time of the year, but the age distribution of the deaths was of the normal type, so that the greater numbers of deaths suggested greater prevalence of the disease rather than unusual severity.

A "New" War Gas

Rear-Admiral BEAMISH asked Sir John Anderson on February 15 about the dangers to the civil population of the possible use of a new war gas by the enemy. Sir JOHN ANDERSON assumed this gas to be arseniuretted hydrogen, the properties and limitations of which had long been well known to every competent chemist. He said that the present civilian respirator gave protection against this gas. He did not consider any further measures were necessary.

Cost of Emergency Register

Dr. ELLIOT stated, in reply to Mr. Groves, that the amount paid to the British Medical Association, whether for out-of-pocket expenses or otherwise, over the past two years was £2,112 7s. 8d., made up of £1,204 for the remuneration of clerical staff engaged solely on the maintenance and use of the Emergency Register, £543 10s. for postages, and £364 17s. 8d. for printing and stationery.

Dr. ELLIOT has also stated that it was for the chairman of the Central Medical War Committee to decide when a meeting should be called. The Government bore the expenses claimed by the members in connexion with meetings, amounting to £20 to date, as well as the expenses of maintaining the register. Any remaining expenses had been borne by the British Medical Association.

R.A.M.C. Rank and Professional Status

Mr. Oliver Stanley was asked by Captain CHARLES TAYLOR whether he knew of the anomalous conditions among the officers of the Royal Army Medical Corps, in that certain officers of the Territorial Army Reserve of Officers had been appointed to a military hospital in their own district, with field rank, and continued their private practices in addition to performing their military duties, while other medical men of some years' professional seniority and with higher professional

qualifications had been called away from their practices in other districts and appointed to the same hospital from the Territorial Army, or with emergency commissions as full-time junior officers. Mr. STANLEY replied that the officers referred to in the first half of the question were selected in peace to fill certain specialist appointments in a war hospital in their own district on mobilization. The appointments in question carried the rank of major, and the officers were selected by reason of their qualifications. The establishment of the hospital had to be completed by posting officers in lower ranks drawn from various parts of the country who had not been similarly earmarked for specialist duties. Every effort was made wherever possible to employ medical officers on duties in which full use was made of their particular qualifications, but they could only be given rank and pay appropriate to the post they actually filled. All the officers in question were equally liable for full-time service. He would inquire into the question of private practice.

Treatment of Nervous Disorders in the B.E.F.

In a reply on February 20 to Sir Francis Fremantle, Mr. OLIVER STANLEY announced that for treatment of nervous disorders in the British Expeditionary Force a psychiatric centre had been established in France, which would be expanded and supplemented as might be necessary. In the United Kingdom arrangements existed for the transfer of such cases to rehabilitation centres organized within the Emergency Medical Service scheme of the Ministry of Health. An Army specialist in psychological medicine was being posted to each command in this country. The medical examination of recruits carried out by the civilian medical boards under the National Service (Armed Forces) Act was specially designed to prevent men who were prone to develop nervous disorders from entering the Army.

Sir FRANCIS FREMANTLE asserted that many soldiers suffering from neurotic diseases had been brought to this country and put into general hospitals under conditions denounced by the War Office Committee of 1922 on Shell Shock. Mr. STANLEY asked Sir Francis to send him details of such cases.

Massage Facilities.—Dr. ELLIOT declared on February 15, answering Mr. Gallacher, that he appreciated the importance of maintaining massage facilities. Although there was at the beginning of the war some curtailment of the work of the massage departments of some hospitals, there had been a general reopening of out-patient departments at which massage treatment was given. Provision for massage was also considerably increased under the emergency hospital scheme.

Liver Supplies.—Mr. W. S. MORRISON informed Mr. Parker on February 15 that the recent shortage of supplies of liver was a consequence of the considerable reduction in the slaughtering of livestock during the severe weather conditions of the past few weeks. Supplies of imported liver were normal, and with the increase of slaughtering supplies of home-produced liver were approaching more normal levels. Hospitals and manufacturers of pharmaceutical products received priority of allocation of liver where they made their requirements known. Prices for liver were already controlled.

Work of Medical Boards.—Mr. ERNEST BROWN said on February 20 that the work of the Recruiting Medical Boards was distributed as evenly as practicable among the members of the panels. He was not aware of any grave dissatisfaction with these arrangements among the medical profession, and he did not think it would be in the public interest to alter them.

Service Patients in Tuberculosis Sanatoria.—In a number of sanatoria, as in other hospitals under the casualty scheme, Service patients are occupying blocks of beds which have been organized for casualty purposes. The accommodation in sanatoria which is being used in this way for non-tuberculous patients is quite separate from that occupied by tuberculous patients.

Powers of Welsh Board of Health.—The additional powers of the Minister of Health which it is proposed to exercise through the Welsh Board of Health are those relating to (*a*) housing and town and country planning; (*b*) general local sanitary services—for example, water supply, sewerage and sewage disposal, public cleansing, as well as certain other local government services; (*c*) alterations of boundaries of local government areas.

Medical News

The annual meeting of the Central Council for District Nursing in London will be held at the County Hall, Westminster Bridge, S.E., at 2.30 p.m., on Thursday, February 29.

The second International Congress of Eugenics has been postponed indefinitely. Further information can be obtained from the general secretary, Professor G. Constantinesco, director of the National Zootechnical Institute, Strada Dr. Staicovici 63, Bucarest.

The fourth Argentine Congress of Obstetrics and Gynaecology will be held at Buenos Aires this year. Further information can be obtained from the general secretary, Santa Fé 1171, Buenos Aires.

The Minister of Pensions (Sir W. J. Womersley) will visit St. Dunstan's Hospital, Ovingdean, Brighton, on Friday, March 8, to open the new operating theatre, which has been built in connexion with the conversion of the convalescent and holiday home into a war hospital for the reception of serious eye casualties in the present war. The treatment of these cases will be dealt with at the hospital as an integral part of the organization of St. Dunstan's. The hospital is capable of taking 200 patients. The theatre block, together with the incidental expenses of the conversion, at a total cost of £7,000, was the gift of Lord Nuffield. The site of the new block has been carefully chosen from every point of view, and the greatest care has been taken in the planning and equipping of the theatre to allow work to be carried on should any of the services be interrupted by enemy action.

The Royal Institute of Public Health and Hygiene has appointed Lieutenant-Colonel J. S. K. Boyd, R.A.M.C., to deliver the Harben Lectures for 1940. His subject will be: "Modern Practice in War-time Immunization of Soldiers and Civilians."

In the *Acta Medica Scandinavica* for October 17, 1939 (vol. 102), is printed the address of the late Professor C. G. Santesson given in May last year to celebrate the publication of the one hundredth volume of this well-known medical journal founded by Professor Axel Key, who was its first editor.

The issue of the *Bulletin de l'Académie de Médecine* for December 19, 1939, contains a report on the vaccinations and revaccinations performed in French protectorates during 1938 and in Algeria and French Colonies in 1937.

Ugeskrift for Laeger, the journal of the Danish Medical Association, has issued an appeal to every Danish doctor to contribute 10 kroner to the Danish Red Cross Ambulance undertaking work in Finland. It is hoped that by this means 20,000 kroner will be subscribed.

The January issue of the *Bulletin de l'Office International d'Hygiène Publique* is devoted to scarlet fever in Sweden from 1866 to 1937 by N. O. Heinertz, and in Australia from 1923 to 1937 by Dr. J. H. L. Cumpston.

Although it has several vacant seats the Académie de Médecine has decided not to make any further elections before the end of the war.

Dr. G. Roche Lynch, vice-president of the Institute of Chemistry, has been reappointed representative of the institute on the Poisons Board.

Dr. Smith Ely Jelliffe has been made an honorary member of the Dutch Society of Psychiatry and Neurology.

More than half a million dollars has been made available for the Federal State programme of venereal disease control, of which 297,398 dollars has been allotted to New York State.

Since September 19 epilepsy has been a notifiable disease in California.

The Danish island of Limfjord has 200 inhabitants, who have little contact with persons outside the island. Although healthy in other respects, they almost all suffer from colour blindness.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

In England and Wales diphtheria, scarlet fever, and whooping-cough declined in incidence during the week, while there was a rise in the notifications of measles, cerebrospinal fever, and pneumonia. Enteric fever was less prevalent than at the corresponding time last year. In Eire and Northern Ireland diphtheria was more prevalent than in the immediately preceding weeks, and in Northern Ireland both measles and whooping-cough are on the increase.

Cerebrospinal Fever

The rise in the incidence of cerebrospinal fever in England and Wales and in Scotland in recent weeks is noteworthy. Comparison is made with the previous year in the accompanying graph.

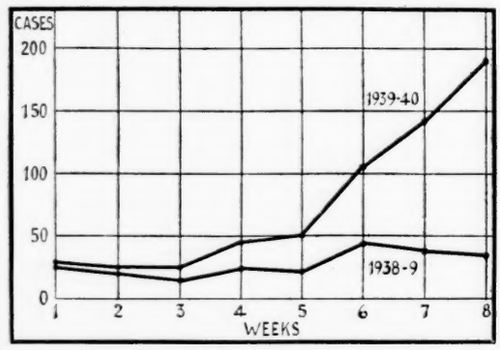

FIG. 1.—Chart showing the number of cases of cerebrospinal fever in England and Wales (London included) notified in the eight weeks December 10, 1938, to January 28, 1939, compared with the eight weeks December 9, 1939, to January 27, 1940.

Despite the total increase in cases only one additional administrative area has been affected compared with last week, the increase has been general, and has affected urban and rural districts relatively as much as the large towns. Cumberland 4 (Carlisle 3, Border R.D. 1); Devon 7 (Exeter 3, Plymouth 2, Exmouth U.D. 1, Plympton St. Mary R.D. 1); Essex 4 (Colchester 1, Leyton M.B. 1, Thurrock U.D. 2); Gloucester 7 (Bristol 2, Kingswood U.D. 1, Stroud U.D. 3, Stroud R.D. 1); Kent 6 (Canterbury 1, Broadstairs and St. Peter's U.D. 1, Dover M.B. 1, Orpington U.D. 2, Sheerness U.D. 1); Lancaster 12 (Bolton 1, Liverpool 3, Manchester 2, St. Helens 1, Crosby M.B. 1, Lancaster M.B. 3, Lytham St. Anne's M.B. 1); Lincoln (parts of Lindsey) 7 (Grimsby 1, Lincoln 1, Horncastle R.D. 1, Spilsby R.D. 4); London 13 (Bethnal Green 1, Camberwell 2, Chelsea 1, Greenwich 1, Hackney 1, Islington 1, Paddington 1, Wandsworth 2, Westminster 1, Woolwich 2); Middlesex 6 (Harrow U.D. 2, Hornsey M.B. 1, Tottenham M.B. 1, Uxbridge U.D. 2); Norfolk 5 (Great Yarmouth 1, Norwich 2, Wymondham U.D. 1, Forehoe and Henstead R.D. 1); Oxford 6 (Oxford C.B. 5, Banbury R.D. 1); Southampton 10 (Bournemouth 1, Portsmouth 4, Aldershot M.B. 2, Farnborough U.D. 1, Fleet U.D. 1, Hartley Wintney R.D. 1); Surrey 9 (Barnes M.B. 1, Farnham U.D. 1, Guildford M.B. 3, Woking U.D. 3, Guildford R.D. 1); Sussex East 8 (Brighton 2, Hastings 1, Cuckfield U.D. 2, Lewes M.B. 2, Newhaven U.D. 1); Warwick 7 (Birmingham 6, Coventry 1); Wilts 6 (Calne M.B. 1, Swindon M.B. 1, Calne and Chippenham R.D. 2, Marlborough and Ramsbury 1, Mere and Tisbury 1); Yorks (North Riding) 6 (Easingwold R.D. 1, Richmond R.D. 4, Stokesley 1); Yorks (West Riding) 7 (Bradford 1, Leeds 2, Sheffield 2, Colne Valley U.D. 1, Darton U.D. 1); Glamorgan 11 (Cardiff 3, Swansea 1, Gelligaer U.D. 2, Maesteg U.D. 1, Port Talbot M.B. 3, Cowbridge R.D. 1); Monmouth 10 (Newport 5, Ebbw Vale U.D. 2, Mynyddislwyn U.D. 1, Risca U.D. 1, Chepstow R.D. 1).

No case was notified in Denbigh during the week, and the Wrexham outbreak appears to be at an end. In all there have been in the district 39 cases to date (24 in the borough and the remainder outside, including 3 from adjacent parts of Flintshire, 1 each from Overton, Mold, and Caergwrle), of which 2 patients have died. Cerebrospinal fever is also widely distributed in Scotland; of the 55 administrative areas notifications were received from 16, one more than last week. More than 3 cases were notified in: Glasgow 11, Berwick County 6, Edinburgh 5, Dundee 4.

Influenza

For the fifth week in succession there has been a sharp increase in the incidence of pneumonia, which is almost certainly due chiefly to the prevalence of influenza. The accompanying chart shows the even more pronounced rise in

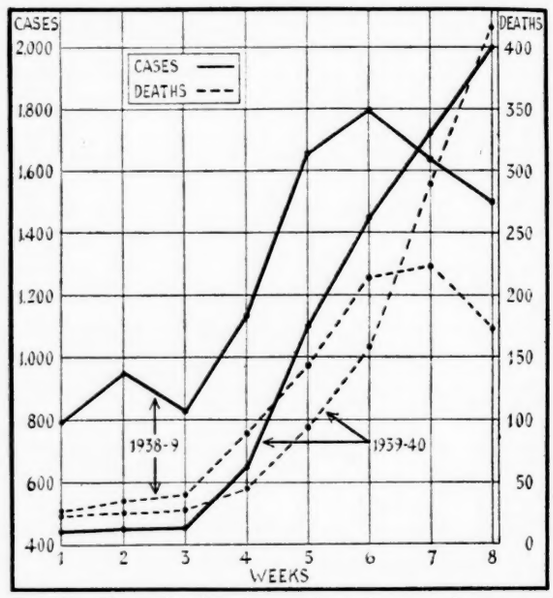

FIG. 2.—Chart showing the number of cases of pneumonia (influenzal and primary) and the number of deaths from influenza in England and Wales (London included) notified in the eight weeks December 10, 1938, to January 28, 1939, compared with the eight weeks December 9, 1939, to January 27, 1940.

the deaths ascribed to influenza during the same period. While the total number of cases of pneumonia (influenzal and primary) has been less in the last eight weeks than in the corresponding period of 1938–9, the more rapid rate of increase from a much lower level suggests that the epidemic may be greater in volume and in duration. That it is more severe is shown by the number of deaths, chiefly among the aged, but no age group has escaped. The type of infection has remained more or less constant in the last few weeks—severe pharyngitis, laryngitis, and tracheitis, with a varying amount of constitutional disturbance—but there are indications that it is becoming less severe, especially in the younger and middle age groups.

In some counties pneumonia and measles are equally prevalent—for example, Lancaster, pneumonia 371 (Manchester 74, Liverpool 74, Blackpool 1), and measles 471 (Manchester 6, Liverpool 10, Blackpool 73); Yorks (West Riding), pneumonia 195 (Sheffield 58, Leeds 19, Bradford 15), and measles 179 (Sheffield 1, Leeds 7, Bradford 22); Warwick, pneumonia 97, measles 87; Nottingham, pneumonia 61, measles 64; Chester, pneumonia 44, measles 66. On the other hand, wide differences were noted in the incidence of the two diseases in certain counties, notably—Cumberland, pneumonia 23 (Carlisle 12, Border R.D. 0), measles 324 (Carlisle 185, Border R.D. 40); Gloucester, pneumonia 45 (Bristol 20, Gloucester 6, Cheltenham M.B. 6), measles 302 (Bristol 27, Gloucester 36, Cheltenham M.B. 111 and R.D. 29); Glamorgan, pneumonia 59 (Swansea 7, Cardiff 6), measles 353 (Swansea 240, Cardiff 5); Monmouth, pneumonia 20 (Ebbw Vale 4), measles 119 (Ebbw Vale 26). In London (as in Birmingham, Manchester, and Liverpool) notifications of pneumonia greatly exceeded those of measles, 102 against 27.

No. 4

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended January 27, 1940.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1940					1939 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	190	13	46	4	1	34	3	11	1	—
Deaths		7	3				1	2		
Diphtheria	720	21	150	37	52	1,364	124	211	46	36
Deaths	21	1	14	2	3	26	1	5	2	—
Dysentery	29	2	15		—	29	2	15		—
Deaths			—	—	—			1	—	—
Encephalitis lethargica, acute	3	—	1		—	3	—	—		—
Deaths		—	2				2	1		
Enteric (typhoid and paratyphoid) fever	13	4	4	7	—	17	2	3	3	2
Deaths	2	—	1	—	—	—	—	—	—	—
Erysipelas			55	9	7			104	5	7
Deaths		—	—				1	—		
Infective enteritis or diarrhoea under 2 years										
Deaths	38	7	5	6	—	38	12	6	6	3
Measles*	3,297	27	64		479		31	32		1
Deaths	5	—	1	—	5	3	—	—	—	—
Ophthalmia neonatorum	73	5	15		1	91	14	28		—
Deaths										
Pneumonia, influenzal†	2,002	102	120	4	19	1,507	151	68	8	37
Deaths (from influenza)	417	46	120	9	9	173	28	41	3	9
Pneumonia, primary			725	18				373	9	
Deaths		144‡		33	26		20		24	22
Polio-encephalitis, acute	—	—				2	—			
Deaths		—					—			
Poliomyelitis, acute	8	—	—	1	—	15	1	3	—	—
Deaths		1	—				1	—		
Puerperal fever	—	5	8	4	1	8	8	10	2	2
Deaths		—					1§			
Puerperal pyrexia	171¶	20	17		3	158	16	29		1
Deaths										
Relapsing fever	—	—			—	1	—			—
Deaths										
Scarlet fever	1,061	36	140	42	71	1,742	166	477	38	79
Deaths	1	—	—	—	—	2	1	1	—	—
Small-pox	—	—	—		—	—	—	—		—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough*	575	7	23		22		250	468		30
Deaths	7	—	—	1	2	14	4	10	1	2
Deaths (0-1 year)	500	54	125	39	31	377	70	72	38	34
Infant mortality rate (per 1,000 live births)						57	58			
Deaths (excluding stillbirths)	10,015	1,660	1,660	351	282	5,697	1,111	820	256	193
Annual death rate (per 1,000 persons living)			32.2	23.4	24.8	14.0	14.1	16.6	17.2	17.1
Live births	5,357	772	871	364	259	5,794	969	882	315	226
Annual rate per 1,000 persons living			17.6	24.3	22.7	14.2	12.3	17.9	21.2	20.0
Stillbirths	260	25	39			241	35	42		
Rate per 1,000 total births (including stillborn)			43			40	35	44		

* Made notifiable generally on November 1, 1939.
† Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.
‡ The figure now includes deaths from all forms of pneumonia. Previous to this year deaths from primary pneumonia were classified separately.
§ Death from puerperal sepsis.
¶ Includes figures for puerperal fever.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

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QUERIES AND ANSWERS

Laryngeal Diphtheria in a Woman of 72

Dr. FINDLATER BROWN (Kingston, Jamaica) writes: Allow me space to direct the attention of your readers to a case of laryngeal diphtheria (verified bacteriologically) in a female patient 72 years of age. She was severely ill, and was made worse by marked cerebral symptoms. Recovery was uneventful, the patient leaving hospital on the twentieth day of her stay and on the twenty-second day of her illness. What interests me at this moment is the age of the patient. Can any information be obtained from others possessed of experience in parallel cases? The maximum age of individuals in whom this disease occurs in Jamaica is 55 years.

Income Tax

Allowance for Wife's Earnings

Inquiries have reached us as to the conditions under which some relief is obtainable in respect of payments made to a wife for assistance in the practice.

*** Payments made to a wife by her husband for assistance—for example, in keeping the books, attending to or supervising the cleaning of the surgery, waiting room, etc.—are deductible in calculating the husband's profits, but of course are assessable on the wife as her income. The latter fact, however, does not leave things as they would have been if the payments had not been made, because under Section 18 of the Finance Act, 1920, an additional allowance is due in respect of a wife's earned income. For 1940–1 this allowance will be five-sixths of that earned income or £45, whichever is the less. Thus if the "wages" paid to the wife have been £52 for the year, the earned income allowance will be 1/6 of £52 = £9, and the special allowance will be £43, the combined reliefs covering the £52 and leaving no net assessment on which tax will be payable. There is thus a clear gain as compared with the tax payable if no "wages" had been paid for the wife's work in the practice. In passing it may be pointed out that whereas for 1939–40 £56 would similarly have escaped net liability, the reduction in the earned income relief to one-sixth for 1940–1 will produce for that year an assessment on the wife's earnings of £56 − (£9 + £45 =) £54—that is, £2 at, presumably, 7s. 6d.—that is, 15s. It may be a little irritating to receive a supplemental demand for this small amount of tax, but it will at least be a guarantee that full advantage has been taken of the special allowance. The revenue authorities usually require some evidence that the £50 was paid as between employer and employee and not as part of the domestic financial arrangements between husband and wife—that is, that a sum was agreed as payable for services to the practice, that some duties were in fact performed, and that the agreed payments were made and duly recorded in the books of the practice. Retrospective effect to such arrangements will not be given.

LETTERS, NOTES, ETC.

"Mental Health"

The first number, dated January, 1940, of a new periodical, *Mental Health*, has been published jointly by the National Council for Mental Hygiene (76, Chandos House, Palmer Street, S.W.1), the Central Association for Mental Welfare (24, Buckingham Palace Road, S.W.1), and the Child Guidance Council (emergency address, 23, Queen Square, Bath). It takes the place of the previous quarterly *Mental Hygiene* and of *Mental Welfare*, and the editorial board consists of Dr. Doris M. Odlum, Miss Evelyn Fox, and Dr. R. G. Gordon. The price of single copies is 10d.; annual subscription, 3s. 6d., post free. It has long been the desire of the three organizations to achieve closer co-operation; and the need for economy and for avoiding overlap and waste of effort, which has become imperative owing to the war, gave an opportunity for taking the first step towards this goal. The joint journal, with wider scope, should represent the whole field of mental health in true proportion, and the linking up of the Child Guidance Council will extend the field in a way which is most important at all times, and especially during a war. The three opening papers of the first number are by Dr. Emanuel Miller, on "The Bedwetting Problem"; by Miss Edna M. Henshaw, on "Some Psychological Difficulties of Evacuation"; and by Mr. John C. Raven, on "Matrix Tests for assessing Mental Ability, designed in accordance with Psychological Principles." These articles are followed by current news and notes, and book reviews.

Treatment of Influenza

Dr. D. OCKMAN (Kearsley, Lancs) writes: I have read with much interest the treatment of influenza described by Dr. W. N. Leak (February 17, p. 286). Perhaps your readers may be interested to know an alternative treatment based on an alternative conception of disease. I consider influenza to be a saturation of the blood by the influenza toxin, a condition well within the powers of the *vis medicatrix naturae*. (1) Seidlitz powders for detoxication, relief of headache, etc. (2) Ample fluids, such as hot black-currant tea, etc., for diaphoresis, diuresis, expectoration. (3) High vitamin diet of egg-yolk, orange juice, milk, fruit. (4) Mist. camph. co., to promote expectoration. I have thus "cured" scores of cases of influenza without the aid of aspirin, phenacetin, barbitone, hyoscine, sulphapyridine, chloroform, morphine, or bromides. All my patients have returned to work without carrying a miscellaneous variety of chemicals in their blood.

Herniotomy at the Age of 93

Professor G. GREY TURNER, F.R.C.S., writes: If Drs. J. A. Ross and A. Fraser will look among the "Letters, Notes, etc." of the *British Medical Journal* for February 27, 1932 (p. 410), they will find a brief communication from me, in response to an earlier one by my friend Dickie of Middlesbrough, on operations in old age. There is related the case of a man of 93 on whom I was persuaded to operate for a double inguinal hernia. Strangulation demands operation whatever life's span, but I question the wisdom of a radical cure except under *exceptional* circumstances.

Mr. C. C. HOLMAN, F.R.C.S. (Northampton), writes: Drs. Ross and Fraser (February 17, p. 256) wish to hear of a similar case. On February 19, 1928, I operated on a man of 90 for radical cure of a large direct hernia; it was not strangulated, but gave him much pain. I used a local anaesthetic; the only drawback to this was the difficulty of maintaining communication with a patient who, although vigorous, was stone deaf. Recovery was uneventful, and he carried on an active existence until his death some six months later.

Corrigendum

Dr. GERALD SLOT (London, W.1) writes: In your issue of February 17 (p. 272) I am reported as having said that picrotoxin is the best agent for dealing with barbiturate pneumonia. This is an inaccurate report. I have no experience of picrotoxin in barbiturate pneumonia. What I said was that for resuscitation and stimulation of the respiratory centre when caused by an overdose of barbiturate, picrotoxin given at fifteen-minute intervals intravenously seemed to me to be the most valuable agent, and such a solution might find a place on the anaesthetic table. This drug is apparently far more widely known in America than here. From private conversations with several anaesthetists, they seem to confirm this view. I hope to publish a short paper on this soon.

Schools, 1940, published by Truman and Knightley, Ltd., scholastic agents, of 61, Conduit Street, W.1, includes an evacuation supplement giving the addresses of evacuated schools. The price is 3s.; postage 6d. (abroad 1s.).